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THE CITY OF COLORADO SPRINGS

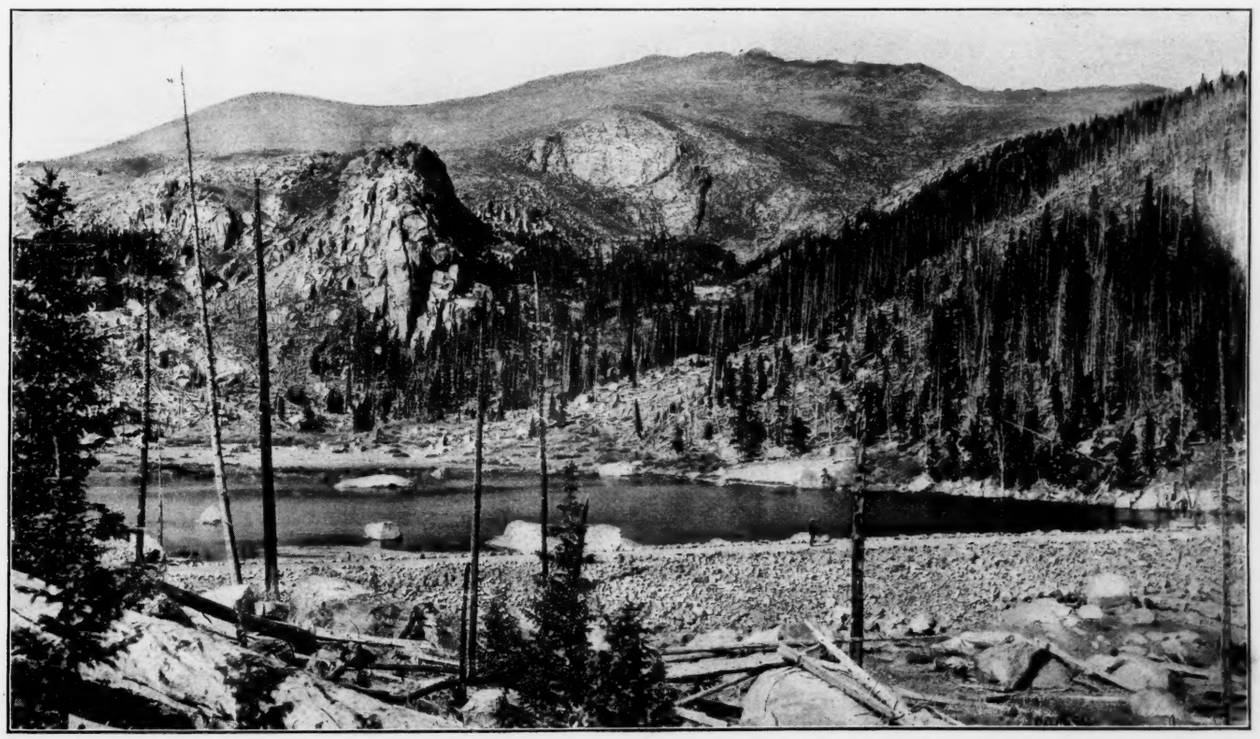
The Location Chosen for Æsthetic Rather Than Commercial Advantages—Destined, However, to Be Influential in State Affairs—Its Rapid Development

By Our Special Correspondent

"FEW cities have made the progress and kept so closely to high ideals as has the city of Colorado Springs," said Mayor J. R. Robinson, in a recent talk on The Ideal City. "From its founding until the present hour, there has been before the minds of its builders the vision of a city of beauty, culture, righteousness and healthfulness—a city, in brief, where in the words of Aristotle, 'Men may live a common life for a noble end.'

NOT A COMMERCIAL CENTRE

"The genesis and evolution of Colorado Springs differ materially from most, if not all, of our western cities located upon the frontier. In selecting the site of modern cities, commercial advantages alone control in nearly every instance. Proximity to industrial fields, real or prospective railway facilities, avenues of travel, water for domestic use and for power, relation to fuel, and so forth—these are the prime considerations. While these conditions, no doubt, entered into the calculations and aided in deciding the selection of the site of Colorado Springs, æsthetic considerations controlled the decision. The beauty of the location appealed irresistibly to its founders. They were men of business; but, like most of our best pioneers, the poetic and æsthetic were combined with the practical and prophetic. When the town was located, there was little prospect of agricultural development of the adjacent country. Stock raising



A NATURAL RESERVOIR, AT AN ELEVATION OF 11,300 FEET—LION ROCK AT LEFT OF CENTRE

could not be expected to build the town. No coal had been discovered in the vicinity, and only rumors of gold had excited the imagination and induced a few to cross the plains. But the mountains and plains were here in ideal relations; overarched by heavens of blue, tinted into a thousand changing colors by the sun, and flecked with shadows of fleeting clouds carried before the shifting currents of pure, health-giving breezes. These conditions would scarcely move the average practical man; but they did the founders of our city, and people have marveled much since at the results.

"When we predict that Colorado Springs will be a large city, our prediction is based upon the operation of causes which have produced results, and are still in operation. We retain all our earlier advantages and attractions, and to these many have been added. These advantages and attractions are not ephemeral, but as eternal as our mountains, our sunshine and blue skies.

MANY EVIDENCES OF PROSPERITY

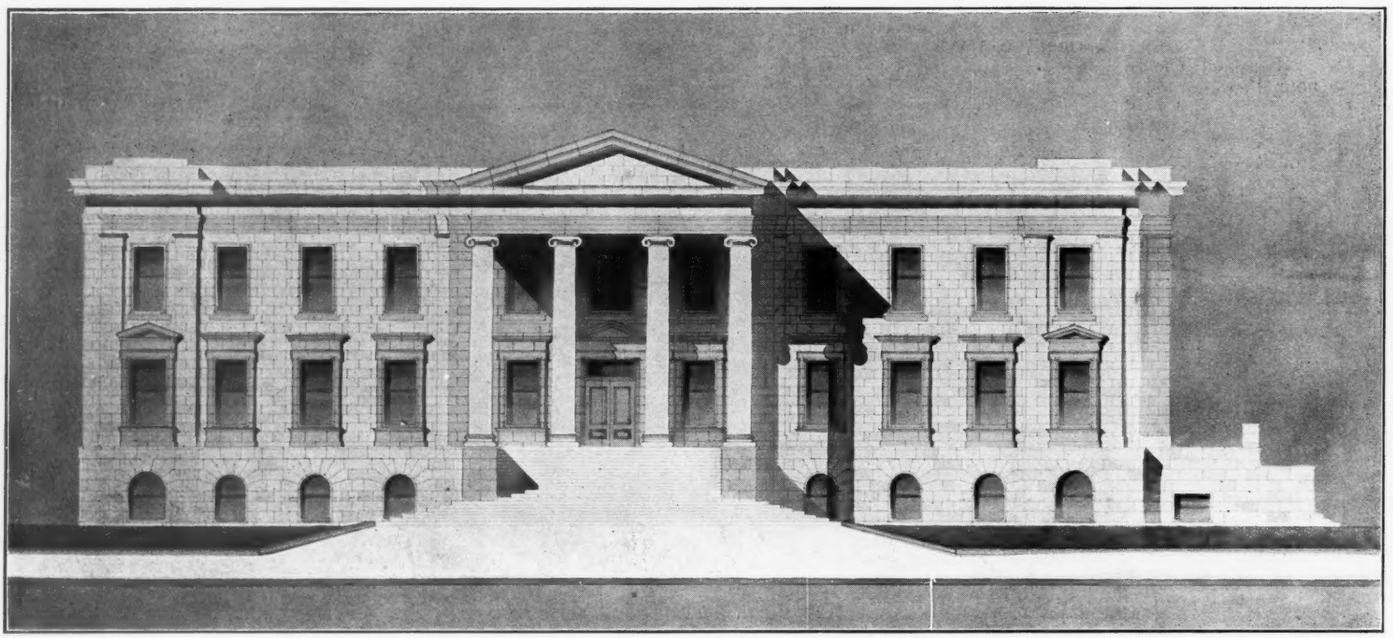
"The foundation of our prosperity and growth is being constantly broadened and strengthened. Large, substantial, many-storied business blocks are displacing the one-story structures. Large churches at $200,000; and its public school system, hospitals, churches and other public buildings are the envy of even larger cities.

The financial report of the city auditor, Mr. I. S. Harris, on July 1, 1902, showed a funded debt of about $1,242,000, which included $1,009,000 for waterworks bonds; $76,000 for sewer bonds; $39,000 for bridge bonds, and $118,000 for city hall bonds. There were outstanding warrants on that date amounting to $99,083.97, and a treasurer's cash balance of $146,447.32. The floated indebtedness aggregated $59,678.90, delinquent taxes, $123,993.60. The tax rate for the year was 10.4 mills upon an assessed valuation of all taxable properties, aggregating $22,007,730. The estimated value of all property was placed at $25,000,000.

THE WORK OF THE CITY ENGINEER

The city engineer, Mr. E. W. Case, has not only the responsibility for all construction work in connection with street and sewer improvements, but for the engineering work in connection with the waterworks department as well.

The city has constructed and maintained four reservoirs for irrigation purposes, their capacity aggregating 458,000,000 gallons, at a



THE NEW CITY HALL OF COLORADO SPRINGS

are being built to meet the needs of increasing numbers of devout worshippers. Noble school-houses are being built every year to meet the needs of a rapidly increasing population. Our college can scarcely keep pace with the demands upon it, though its growth in wealth and new buildings is one of our many marvels. Our hotels, while numerous, and in equipment unsurpassed by the leading cities of the country, can scarcely meet the public demands. Capital is not timid in investing upon the basis of future growth, as is evidenced by the street-car system now being perfected upon a scale of magnificence not surpassed in any city, and the large investment in other public utilities."

In 1900 the population of Colorado Springs did not equal 25,000, but it now has a population of 30,000. With an area of nine square miles, it has one hundred and twelve miles of streets and avenues, the former being one hundred and the latter one hundred and forty feet wide; it has forty-three miles of sanitary sewer system and forty-five miles of electric railway; a water system valued at $3,000,000 with an available supply of 1,146,418,000 gallons—practically inexhaustible—with one hundred and five miles of water mains, and two hundred and ninety-two fire hydrants; public, high school and college libraries, aggregating about 50,000 volumes; a city hall valued total cost of $41,183, the system of reservoirs having been completed in 1894, all of which is under the charge of the city engineer.

Up to March 1, 1902, there had been reduced to grade one hundred and twelve miles of streets and avenues, the former being one hundred and the latter one hundred and forty feet wide; and there had been constructed up to that date 13,208 lineal feet of stone sidewalk and 17,683 lineal feet of cement walk, varying in width from five to sixteen feet.

The sanitary sewer system, which was commenced in 1888, has been added to from year to year, and now aggregates a total length of 214,462.6 feet, ranging in diameter from six to twenty-one inches, the whole system being constructed at a cost of nearly $200,000. The work will be extended as rapidly as appropriations will permit until every portion of the city is covered.

The health of the city is looked after more carefully than that of most eastern cities which are possessed of more money and which have greater need of diligence in this particular direction. The health department is under the supervision of Health Commissioner Dr. Peter O. Hanford, who has held the office ever since its creation. There are bureaus of sanitation, plumbing and food inspection. Careful attention is given to house inspection, with permanent records

HOW COLORADO SPRINGS SPRINKLES ITS STREETS

showing the sanitary condition of all property in each block with improvements. A record showing the communicable or contagious diseases occurring in properties is also kept. It has what few cities of its size can boast of, a new and complete chemical laboratory under the direction of an expert.

The commissioner has supervision of the collection and removal of garbage, the regular systematic analysis and inspection of the water supply, and he employs all the up-to-date methods for maintaining the public health at a high standard.

A Splendid Waterworks System

The waterworks plant is the only public utility owned by the city. It secures its light and heat from private corporations. The plant had its origin in 1878, when the population of the city numbered but 4,000. A mass meeting was the result of a call given by a few leading citizens that resolutions be adopted, instructing the Council to call for a bond issue of $80,000 for the purpose of commencing the water system. The growth of the city has compelled frequent additions to the system, until the city now has six reservoirs at elevations from 6,211 feet to 12,099 feet, and capacities ranging from 1,250,000 gallons to 492,168,000, and aggregating 1,146,418,000 gallons; the last reservoir having been constructed in 1896, and the whole at an actual cost of $130,500. The pipe lines have cost $412,650.37. There are now over 6,000 taps on the system, not including many large consumers, such as railroads, power stations, hotels, laundries, fire service in large buildings, etc. These are supplied direct from mains run into the premises. Superintendent Hopkins, in his annual report for the fiscal year ending March 1, 1902, said: "In addition to the increased demand for water for domestic use, there has been a greater demand along all lines. Thousands of trees have been planted, city parks extended, new sewers laid, and three new electric car sprinklers just been put into service. Our large consumers are constantly increasing their capacity and demand for more water. Nearly half a million gallons of water are used per day by the street sprinklers alone. A conservative estimate of the amount of water used per day is between seven and eight million gallons."

There are but nine cities in the United States which have a larger park acreage than Colorado Springs, there being 1,574 acres devoted to the public parks. Mr. W. H. McIntyre, chairman of the Public Grounds and Building Committee, in referring to the parks of Colorado Springs, aptly said:

"The mistake of many rapidly growing cities of the west has been in not providing at an early date a sufficient number of public parks. As the cities have grown, these have had to be provided often at a great expense. The parks are the playgrounds of the people, and where population is congested, are as essential to the health and happiness of the masses as is the supply of water and good sanitation. In a city of the character of Colorado Springs, their æsthetic benefit is hardly to be computed outside of any material benefit. Colorado Springs has built for the future in this respect, as in other ways. It has many pretty 'breathing places,' and the foundation for others that will make it in time notable among cities of its rank as a place of attractive parks."

MUNICIPAL TRADING*

European and American Methods and Results Compared—The Views of an Advocate of Private Ownership of All Public Utilities

By Robert P. Porter

County Council Tramways

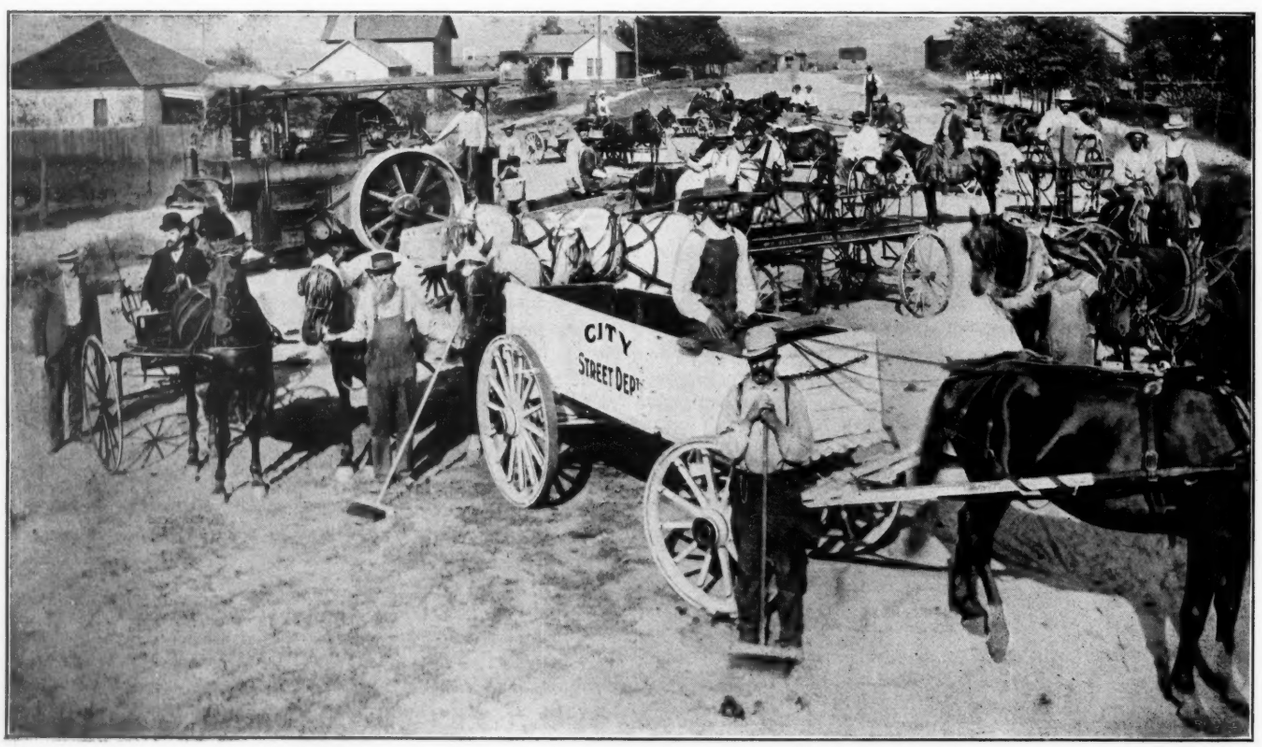
While there undoubtedly exists in the minds of many a serious question as to the wisdom of the London County Council operating either omnibuses, tramways or tubular railways, the ability and energy that body has devoted during the last ten years to the London locomotion problem deserves nothing but unqualified praise. It has put to work some of the ablest engineers on the subject, has carefully examined every proposed scheme, and in the main the influence of the Council has been exerted in harmonizing and systematizing the spasmodic efforts of private enterprise, which under conditions existing in England naturally sought the locations where traffic was densest and quick returns most easily obtained. In very much of this work, though perhaps not in all, the County Council had fulfilled the functions of a legislature thoroughly imbued with the highest form of municipal enterprise. As to whether the results of its labors in this direction would have been more beneficial to the community had it kept within these functions and not descended into the arena of competition as a promoter of profit-making enterprises, there naturally exists wide differences of opinion.

The outcome of the various investigations conducted by the County Council has resulted in that body taking up, in a practical way, the tramways of London, and if the present policy is adhered to, in a few years the county of London will be the undisputed owner of all tramways within its border. Not only is it the policy to absorb existing tramways but to operate them, and at the present moment we have the interesting experiment in municipal trading in South London of a tramway system owned and operated by the county authorities, while in North London a larger system, owned also by the county of London, has been leased to a private concern —the North Metropolitan Tramways Company—until 1910. Sufficient time has not yet elapsed to show the result of these two experiments, but the fact that the two methods of dealing with the transit question have an opportunity to work out for a period of ten years side by side will give students of economic questions an opportunity to study the two plans under like conditions. It may be that at the end of the lease the North Metropolitan Tramways Company will have paid the county such a goodly share of the profits that the administrators will be glad to renew the lease for another term of years, and perhaps lease the other tramways also to private companies. On the other hand, the Highways Committee may have shown such ability in the tramway business that the public will favor the operation of all lines within the county of London by the Council.

Leasing vs. Operation

These two systems may be left to work out their own salvation in their respective ways, though I am strongly of opinion that the North London leasing system will in the end give the best returns both in revenue to the city and in reduced fares to the passengers. Speaking roundly, we have here two investments: one (the southern system) represents a capital investment of about $4,500,000, operated by the Council, on which the net returns last year were about $45,000; the other (the northern system) leased to a company, represents a capital investment of about $4,250,000, on which the net return to the Council exceeded $195,000. It should be stated,

* This article was read at the International Convention of Municipal Ownership, held in the rooms of the Reform Club, New York City, last February, and published by the courtesy of *Municipal Affairs*.



PART OF EQUIPMENT OF STREET DEPARTMENT OF COLORADO SPRINGS

however, that the Council has reduced the hours of labor of its employees, somewhat increased the wages and incurred other expenditures which they put forward as an offset for the reduction of profits. The result of the working of these two undertakings may decide the future policy of the County Council. If the county of London can continue to secure the same service and more profits out of the leased lines than out of the operated lines, it will hardly be worth while to conduct an enterprise that requires so much experience and such an infinitude of detail to carry out successfully. Commenting on these two enterprises as far as they have gone, Mr. Dixon Davies, in his excellent paper already referred to, says:

"In London the County Council have leased their tramways on the north side of the river on terms which secure them a rent dependent upon the gross receipts of the undertaking. The tramways on the south side of the river they are working themselves. Before the County Council made the purchase of the undertakings the South London trams had been exceedingly profitable, and no doubt the Council determined to retain them, with the idea that they would afford a conspicuous example of the success of municipally managed undertakings. From a financial statement made by Sir John McDougal in October, last year, it appears that the profit formerly earned on the south side of the river had dwindled away with reductions of fares, reductions of hours, increases of wages and other emoluments to the men, to the paltry sum of $45,000; and even that amount would probably speedily vanish if a proper depreciation allowance were made. On the north side of the river, on the other hand, the rent paid to the Council by the company working the North London tramways was $384,205. This, after providing for the interest and sinking fund upon the Council's outlay, leaves the handsome net profit of $197,250, every penny of which is honestly available for the relief of the ratepayer."

A Note of Warning

Meantime the Council is going ahead with the purchase of tramways as fast as the several lines still owned and operated by private companies fall under the act of 1870. Not only this, but new powers have been sought and obtained from Parliament by the Council for the purpose of connecting its various lines and extending the system. In assembling all these tramways, the County Council is undoubtedly, from the point of view of that body, acting wisely, for, with proper connections, they will certainly be made to pay. The outlay, however, will be considerable before the several railways are properly linked together and equipped, as they must be, with electrical traction. The purchases already made, those in course of negotiation and the improvements authorized, and for which power will be sought next session, amount to a total of nearly $40,000,000, and in the course of time the Council will own the entire tramway system of London. The Finance Committee who recently considered these undertakings from a financial point of view, recommended that, as a whole, they might be accepted, and that with the exception of the line from Hammersmith Broadway to Harlsden, "there will be no serious deficit," and to that extent the objection to them on financial grounds is diminished, and some of them seem to promise very satisfactory financial results. At the same time the Committee utters the following note of warning:

"We may point out to the Council that the proposals already approved or now before the Council in regard to the conversion of electric traction of the tramways on the south side of the river, including extensions and smaller undertakings about to be purchased and the necessary generating station, involve an aggregate expenditure of about $27,500,000. The present tramways debt amounts to $6,750,000. In addition to this, there will be the expenditure on the proposed generating station at Pimlico, and for the conversion of the northern system and extension on that side of the river. While we are satisfied, on the estimates which have been before us, that the large capital outlay involved in the development of tramways in London will be ultimately remunerative, we think it well to prepare the Council for the possibility that while these large works are in process of execution the tramways undertaking may occasion a charge upon the rates. A great deal will depend, of course, upon the manner in which the various operations are carried out and the period during which the expenditure remains unproductive. We believe that the Highways Committees are alive to this point, and are shaping their proposals accordingly."

Let us hope the committee are alive to this danger and that the administration of these important undertakings will be wise. It is further to be hoped that the Council's attitude towards private companies ready to invest millions of pounds in other forms of transportation, such as tube railways, will not be that of a competitor scrambing for part of the profits, but that of a public-spirited legislature, anxious to assist the community in obtaining better and cheaper transportation. There is room enough for all in this stupendous field if only good judgment is used in carrying out the several schemes and capable management accorded them after they shall be open to traffic.

An Instance of Wise Management

Before concluding the London situation, it seems advisable to say a few words about the North London Tramway system. This system has to do with three counties—Middlesex, London and Hertford. Here we have a total route mileage, as now planned, of about 120 miles, 56 miles of which are being worked. The system will comprise both tramways and light railways, ultimately to be operated by electric traction. The operating lines of this company now carry annually 165,000,000 passengers, a number which will easily be doubled when their entire system is completed and electric equipment substituted for horse power. A county council in England, having certain powers of supervision over a very large area, is able to take a much more comprehensive view of the traction question than a local authority. When, as in the case of Middlesex, the County Council is the road authority, it is natural that it should want to retain direct control over the use and maintenance of the roads. At the same time, the County Council, like a municipality, is not a body fitted by its constitution to undertake the development of a speculative trading enterprise such as interurban tramway or light railway promotion. Therefore, the Middlesex County Council, in deciding to promote a large system of electric road lines in the county, decided at the same time to leave the working of them, with the associated commercial risks, in the hands of a company. The agreement between the County Council and the company runs as follows. (It may be mentioned that the neighboring county council of Hertford is also a party to the agreement.)

"The cost of constructing these lines, including the necessary road widenings and the acquisition of sites for power stations and depots, is borne by the county councils, who have agreed to grant leases of the system to a company known as the Metropolitan Electric Tramways, Limited, for terms of thirty or forty-two years, respectively, the cost of the machinery, equipment, plant and rolling stock being borne by the lessee company. The conditions of these leases provide that after payment of a moderate rate of interest to the councils and to the company on their respective expenditure, the net profits shall be divided in the case of Middlesex in the proportion of 45 per cent. to the council and 55 per cent. to the company, and in the case of Hertford in the proportion of 40 per cent. and 60 per cent. to the company. The leases also provide that the company's expenditure is to be limited to material which becomes purchasable by the councils at the expiration of the respective terms at a price which will represent their value as part of a going concern."

Here we have embodied in the contract some of the features of the New York and Boston arrangements with private companies. By this last clause the company avoids the expenditure of a large amount of money on permanent way and improvements, for which a comparatively small return would probably be obtained at the termination of the leases. It will be observed that the tenure of the lease is much longer than the average, which is twenty one years. This longer tenure, together with the equitable financial arrangements, will enable the company to conduct its operations in a spirit of liberal enterprise, free from the narrow restrictions which are so common in the arrangements with local authorities. To the County Council the agreement means complete control of the public roads and a sound security that the public money expended will receive its due interest and thus not prove a burden on the ratepayers.

THE GAS INDUSTRY

The history of the gas industry in England, of electric lighting, the housing of the working classes and, within a still more recent period, of the telephone is almost precisely the same as the history of street railways. The municipal trader is inclined to quarrel over details, while he is silent about the principal of rate-aided enterprise. He submits columns of statistical exhibits and figures out, on paper, huge profits. There is no reason why municipalities, if managed with same economies, should not sell gas cheaper than private companies, but municipal traders have never yet been able to prove that that they do. In exhibiting the exhilarating results of municipal trading, numerous comparative tables are prepared for the taxpayers showing the low price of gas and electricity in a city where the municipality owns and operates the plants and the high price of the same commodities in cities where the plants are owned and operated by wicked companies. As a rule, these comparisons are worthless, for they do not take into account, for example, some little factor like the price of coal, which makes all the difference in the world in the cost of electric light or gas.

Just one example: I note a favorite way in England is to compare cost of municipal with company gas or electric lighting. The results are generally thrilling and always bring down the house. The comparison, however, is none the less unfair because nearly all the company gas and electricity is manufactured in London, where the cost of everything is higher; while the municipal gas and electricity is nearly all manufactured in the provinces and the greatest output on and near the coal fields.

Another favorite device may be seen from the following, which I take from the *London Times* of January 16, 1902:

"I marvel that municipal traders should have the audacity to compare Bolton municipal prices for gas and electricity with those charges by private companies at Norwich, where coal is much dearer. As is shown, it only costs .96d. per unit to produce electricity at Bolton, and the municipality has the conscience to charge 3.41d.—a profit of 2.45d. per unit. While at Norwich, where coal is not so cheap, the company has been producing at a cost of 2.4d. and selling at 3.9d.—a profit of only 1.5d. per unit. The comparison is highly creditable to the company."

Bolton is a shining example of municipal trading and, next to Glasgow, is trotted out on the slightest possible provocation, yet it is claimed by those familiar with the facts that its charges for both gas and electric light are excessive, when the fact of its close proximity to the coal fields is taken into consideration. It is easy enough to make profits if you have an absolute monopoly and charge enough for the product.

More than half the gas production of England is in the hands of private companies. The reduction in price of gas made by private companies in England has been as great, if not greater, and as a rule the price charged under exactly similar conditions is less, than by municipalities. In short, in England, as elsewhere, the private companies have set the pace in enterprise, quality and gas and in price. In a recent official inquiry these facts were clearly brought out. It was shown that all enterprise in the gas industry has come from companies because the companies have greater motive for enterprise. The municipalities may follow private enterprise; they never have been known to lead.

MUNICIPAL ELECTRIC LIGHTING EXAMINED

The advocates of municipal trading claim that in the case of electric lighting "the superiority of public ownership is remarkable." It would take a better quality of electric light than supplied by most of the British municipalities for one to see this superioriy—that is, if the comparison is to be made between the company-supplied light of the United States and the municipalized electric lighting of Great Britain. If the quality and cost of electric light is no better than that produced by American methods under private ownership, then I see no advantage in municipal ownership of electric light, for as we shall note, that the "profits" to the ratepayers are difficult to discover.

A committee of the London Chamber of Commerce recently took out the figures from the official returns relating to electric lighting undertakings in England and Wales for the purpose of ascertaining the "net profits"—that is, it endeavored to show what the ratepayer received in return for the risk he takes in guaranteeing the undertaking. The report contains the following table:

MUNICIPAL ELECTRIC LIGHTING

Total capital, inclusive of borrowed capital, provided by towns	$17,083,555
Amount of capital borrowed	15,542,565
Amount of capital borrowed which has been paid off	542,240
Balance of capital borrowed which was outstanding at March 31, 1898	14,952,910
Amount in sinking fund, or loans fund, at March 31, 1898, in respect of capital borrowed	508,210
Average annual income for the five years ended March 31, 1898 (or, if the undertaking commenced during that period, from date of commencement)	1,522,495
Average annual working expenses from the period mentioned in preceding item	843,775
Average annual net profit for the same period	686,600
Average annual amount paid during the same period in respect of principal and interest on capital borrowed	633,295
Average annual amount set apart for depreciation	18,735
Financial result—average annual surplus	53,305

It will be observed that the average amount allowed depreciation ($18,735) is about one-eighth of 1 per cent. per annum, and that the average annual margin of surplus inclusive of this $18,735 is only equal to one-third of 1 per cent. per annum on the total capital expended. What have our municipal ownership friends to say to this statement of facts? Is there anything "remarkable" in such meagre results? As we have seen, the case of electrical undertakings is somewhat different from gas, because the electric industry has not yet reached conditions so far fixed as to enable it to be conducted on a strict system of routine without the combination of push and caution which is the essential feature of private trading. Taking the figures of the electrical trade just given, we see that the surplus receipts over the whole of the municipal electric stations of Great Britain amount to an average annual sum of $53,305. Of this they put the miserable sum of $18,735, or about one-eighth of 1 per cent., to depreciation account, and the ultimate balance of profit is only equal to one-third of 1 per cent. per annum on the total capital expended. Even this beggarly result would be wiped out if it was not for certain little tricks of accountancy, such as charging the law expenses and accountant's fees to other heads in the corporation budget.

It may be well to quote the exact language of the Committee:

"On the face of the summary it appears that, as the result of incurring a debt of $15,500,000, the ratepayers generally, over the whole of the undertakings, have a surplus of only $53,300 when they have divided for the payment of interest, etc., on their loan capital—that is to say, the amount distributable in aid of the rates is about one-third of 1 per cent. only. A cursory inspection of the returns will show that the surpluses are earned in every case in the very big towns, and that the general result among towns of moderate size must have been a deficit met out of the rates, while as for small towns the results are even more unpromising."

This would seem to be a reliable and cautiously worded English opinion on the subject based upon a painstaking collection of facts. Commenting on the report showing the loss on electric supply I find the following in the *Liverpool Courier* of November 4, 1902:

"Still, without going into this vital question of accuracy of accounts at all, sixty towns showed an admitted loss in 1901. Here is the black list: Salford, Eccles, Morcambe, Paisley, Bradford, Bury, Glasgow, Watford, Hanley, Dublin, Whitehaven, Monmouth, Cheltenham, Bath, Stafford, Leyton, Lincoln, Ealing, Shoreditch, Ayr, Dundee, Derby, King's Lynn, Stockport, Southampton, Islington, Tunbridge Wells, Newport, Barking, Birkenhead, Kingston, Redditch, Oldham, Edinburgh, Shrewsbury, Dewsbury, Bristol, Barrow, Blackpool, Gowan, Bedford, Bexhill, West Ham, Ashton-under-Lyne, Wolverhampton, Coventry, Greenock, Leigh, Moreley, Torquay, Gloucester, Plymouth, Portsmouth, Southwark, Hastings, Yarmouth, Leith and Carlisle.

"Amongst them they had borrowed $30,092,350 on the security of the rates; and the employment of that huge sum for the principal and interest of $461,400 without making provision for wear and tear or antiquation of machinery. Was it worth while, one cannot help asking, to mortgage the ratepayers' property for such a purpose and for such results? Only look a little more closely into the matter and you will repeat the question more emphatically. For one of the most

amazing features is the ridiculously small number of ratepayers who use the light in their houses or shops. In Salford there are 36,000 ratepayers and 401 consumers, and the year's loss was $37,445, coming on top of heavy losses in previous years. Municipal enterprise in Salford means, therefore, that in one year 36,000 people put their hands in their pockets in order to supply electric light at a loss to a select body of 401. Nearly 99 non-users have to help to pay the electric-light bill of the hundredth, and the year's loss works out at 4s. 2d., or about one dollar, per ratepayer, accepting the accounts as correct, which they are not. And this monstrous anomaly exists not only in Salford, but in scores of other towns. It has been roundly condemned not merely by conservative newspapers and exponents of 'old fashioned' economic theories, but by the *Westminster Gazette* and the *Speaker* and other credited organs of 'Progressivism.'"

Power Distribution Checked

In the matter of electrical energy, we are told by the *Times* enquiry, there is no doubt that countless industries, great or small, throughout the country, would be enormously facilitated if electric power could be "laid on" to them in the same way as gas or water. Many a trade or enterprise now handicapped by cost of motive power would receive by this means a greater impetus than it would derive in any other direction; and the result might be the conferring of a substantial boon not alone on the persons concerned, but on the country at large, and especially so from the point of view of removing industries from urban into suburban districts. Here, again, however, the socialist idea of keeping alike the "public services" and the means of remunerative employment in the hands of the municipalities has prevailed; and while economy would suggest that electric power should be distributed over a wide area from a common centre, the general tendency of local governing bodies has been either jealously to acquire powers and then not use them, or else to want to set up a separate and distinct plant for each particular district. Elsewhere, the enterprise of the private trader has been restrained because he has known that as soon as the local authority heard of his plans they would probably start a scheme of their own, while even if they did not want to do so at once there could be no certainty as to their future policy.

Telephone Service

The backward condition of the telephone industry of England has been a hindrance to commerce, a source of annoyance to private communication, the subject of investigation by Parliament and a topic of endless discussion and controversy by those interested in both sides of the problem of municipal ownership. The advocates of municipal trading and of state appropriation of public utilities have vociferously maintained that the cause of this lack of enterprise may be traced to the fact that until recently the telephone service was wholly in the hands of a private company. On the other hand, the friends of the company declare with equal force and a strong array of facts that the real cause of the trouble comes from the unreasonable interference and unjust demands of the British Government, which have made it impossible for private capital and enterprise to push ahead, apply the latest inventions and increase the service by reduction of price and extension alike of public and private exchanges. A glance at the history of the telephone in England strongly indicates that the government has played a fast and loose game with those who have undertaken to establish it, with the result that its progress has been retarded because the company never knew quite where it stood.

In the first place, the learned electric savant of the post-office declared after it was in full operation, that the telephone was an ingenious toy, but of no value for commercial purposes. This same official is now vociferously denouncing the Marconi wireless telegraphy as of no commercial value, and the Post Office Department is placing an obstacle in the way of its utilization by refusing to build two miles of telegraph wire and establish all-night service at Poldhu. In this way, officialdom is doing what it can to retard invention and stifle enterprise.

Government Losses on Telegraph

In the case of the telephone, however, when it was finally established between such large centres of population as Liverpool and Manchester, and began to make inroads into the postal telegraph revenues, the Post Office Department became alarmed and interfered. It was decreed subsequently by the courts that the telephone was a telegraph, and that telephones worked for public benefit came under the Telegraph Act, and that therefore the government had a monopoly of them. This was naturally a severe blow to the National Telephone Company and one calculated seriously to impede its enterprise. As the government was not prepared or not sufficiently sure of the financial success of the telephone to take it over bodily, as it had done the telegraph, it licensed the National Telephone Company to work under the Telegraph Act at a 10 per cent. royalty on the gross receipts. The licenses were restricted because they were contingent upon the consent of local authorities who could place obstacles in the way and prevent the laying of wires and otherwise obstruct the system's installation.

For some years the telephone people struggled along, having little faith in the final outcome, until in 1892 the government of the day came to a general arrangement in reference to the telephone business of the country. The British Government took over the trunk wires which connect large towns and placed them under the postmaster general. The business inside towns, which in England is generally called "exchange business," was left in the hands of private companies. This dual arrangement had its disadvantages and, as those who understand the business will realize, its inconveniences. However, the telephone company could do nothing but go ahead along the line mapped out by the government. Having no control over the entire system, being more or less hampered by municipalities in the matter of laying wires, and being compelled to pay over a large royalty to the government, the inducement was not great to invest additional capital.

The government and the company seem to have got along fairly well, giving an indifferent service for a rather high price, until the municipal traders, looking around for new fields to conquer, took the matter up. The Telegraph Act of 1899 gives the municipalities the right to establish and work local systems within their own area in competition not with the government trunk lines but with the telephone company. Now, as everybody knows, the telephone service is not one which lends itself to competition, because it is obviously inconvenient for a telephone subscriber to find that people with whom he wishes to speak are not on his system, but on the system of some other company. This, with the government absorbing the trunk lines and municipalities reaching out after the local business, has discouraged the company which originally undertook the exploitation of the telephone in England, and some of the officers openly say that rather than still further complicate and obstruct business by municipal trading it would be wiser for the government to take it all over and run it with the telegraph as a state monopoly.

There are several reasons why this plan is just now not agreeable to the British Government. In the first place, public sentiment is murmuring against increasing state undertakings. The government has made a mess of the telegraph business, which does not even pay. Up to the present year the British Government has lost the enormous sum of $40,000,000 in the management of the telegraph business. This has become alarming, because the loss is continually increasing, and last year it was $3,000,000. It is generally conceded that a private company, or two private companies, as we have in the United States, would do the business far better and make it profitable.

Municipal Telephones

The actual experience in municipal telephoning up to date has been so unsatisfactory that perhaps the less said about it the better. In the English case, that of Tunbridge Wells, the system cost so much and worked so badly that the city was glad to sell it to the private company. In the case of Glasgow the accounts are being severely criticised. First with regard to capital expenditure: At the inquiry in 1897 the telephone engineer employed by the corporation estimated that for an expenditure of $489,165 he could put 5,200 lines in operation, while according to the published accounts, the total expenditure to May 31 was $963,465 for a total of 5,067 work-

ing lines, which have been erected at a cost of $190 as against the estimate of $90. With regard to the revenue, stated officially at $140,855 for the nine months, in that sum is included the amount paid in advance for telephone services not yet rendered, totalling a sum of $62,085, and trunk and telegram fees amounting to $8,290 which were merely collected on behalf of the post office, and required to be at once paid over less a small commission for collection. To sum up, the conclusion is reached that "had the accounts been properly made out, and a reasonable provision charged for depreciation, and a fair rent for the use of the street, and also a proportion of the preliminary expenses which have been charged to capital, say $12,000 per annum, the result would have been a very serious loss, probably not less than $35,000 or $40,000 for the nine months, which there is every indication will grow in amount year by year." In commenting on the above facts, the *Westminster Gazette,* a paper rather friendly than opposed to municipal trading, says, "these statements certainly furnish considerable food for reflection."

CONCLUSION

As we have seen, most of the advantages of municipal trading have, during the last few years, been exploded. Sound commercial firms in England pay no more for their capital. It has been demonstrated over and over again that a municipality can do the work no cheaper. No one familiar with the facts will contend that a town council constantly changing its membership is a better business board of management than the board of directors of a successful company. There is no proof that the consumer is specially benefited—the service is equally good in the United States under private enterprise, and the cost relative to the cost of labor and of raw material, no more. The assertion that municipal trading affords the only escape from trusts is so well treated by Mr. Davies in his recent paper read before the Society of Arts that I cannot do better than quote his words:

"It is not the power of capital, but the legal monopoly which is the seat of the evil. In this country (if we perhaps except water) there is no reason why there should ever be any other monopoly than the monopoly of superior efficiency. A tramway down one street can be paralleled by a subway or tube down another street. Gas, which was thought at one time to be above competition, is now an alternative to electricity and petroleum. Hydraulic power has no monopoly. It shares its trade in many places with electric power, and in some also with pneumatic power supply. In private hands the constant activity of invention and the rivalry of commerce may be relied upon to secure in a free-trade country competition in one form or another, but upon the principle pointed out earlier in the paper the healthy stimulus and check of competition is always absent from an industry carried on by a corporation. They have a legal monopoly preserved to them by their own by-laws, and supported by such combinations as the Municipal Corporation Association, by means of which the united political power of the local bodies all over the country is focused and exploited so as to secure for them a degree of protection which is absolute. So far, therefore, from municipal enterprise being a check on the evils of trusts, it will, upon examination, be found to expose the consumer to all the oppressive conditions of the American combine."

The question of better control is also effectively treated by Mr. Davies, who says:

"A gas company or a tramway company sees expropriation looming through the fog of local controversy. Its conductors do not see why the authorities choose their own time for the purchase, and therefore they themselves aggravate the situation in order to hasten the decision of the authority to buy out the company at the precise moment when it will suit them, in view of the depreciated state of its undertaking and of the capital difficulties ahead, to part with the concern. If the policy of acquisition were definitely abandoned the authorities would be able to enforce a much more effective system of control."

There is little doubt that our own large cities are tightening their control over such industries, and I expect the gentlemen managing the great street railway and gas and electric lighting enterprises will inform you that they are properly kept under control. The reason for this is undoubtedly the fact that the "policy of acquisition" has not yet been adopted by the American municipal authorities. Because of this, private capital and enterprise have made the most of their opportunities in exploiting these industries, and the public is reaping the benefit without being held responsible for the financial success of the undertaking.

It has been my endeavor to discuss the subject assigned me on its business merits, and the conclusion seems to be that municipal trading does not pay. There is, however, another view of the subject that has been very strongly brought out by the *London Times*—namely, that "municipal enterprise" and "progressive municipalism" are really being made the stepping stones to the collective state. Towards this end, it is claimed, the British socialist is working with all the force at his command. Their allies and friends are the well meaning people who, having no policy of their own, follow on the lead of those who are working a well planned scheme and have decidedly definite aims. "The facile Liberal and Conservative politicians," said the *London Times,* in the editorial which introduced its trenchant series of papers on municipal socialism, "who want to warm the hearts of the people by application of the rates are the hope of the socialist bodies." Whether these people who are now so easily led by the socialists will be able to stop when mischief is being done may well be, as the *Times* says, a matter of conjecture. Once create large municipal staffs; once bring together large bodies of men accustomed to light work, regular employment and good wages; put down plant, erect buildings and purchase land; create vested interests with subtle ramifications, and it will not be possible without using heroic means to rectify a series of mistakes. Then, too, there is the question of the capacity of our public bodies to deal effectively and wisely with all the functions thrust upon them. And, gravest uncertainty of all, there is the question whether the purity, such as it is, of municipal government will be maintained if it exercises a multitude of duties, touches finance at many points and makes politics and business almost synonymous.*

* This paper as a whole is not intended so much to convey my opinions on the subject, which I realize are of small moment, but what a very considerable body of thoughtful and intelligent men in England are thinking after a quarter century of experience of municipal trading. For the benefit of those who wish to pursue the subject still further, I append the following list of publications, to nearly all of which I have been more or less indebted in the preparation of this paper:

Municipal Trading—Report from the Joint Select Committee of the House of Lords and the House of Commons, together with the Proceedings of the Committee, Minutes of Evidence and Appendix. 1900. Price 4s. 3d.

Index and Digest of Evidence to the above. Price 8½d.

The Cost of Municipal Trading, by Dixon H. Davies. A paper read before the Society of Arts, with the discussion thereon, February 1, 1899. Price 2s.

Municipal Trading, II., by Dixon H. Davies. A paper read before the Society of Arts, January 28, 1903.

The Limitations of Municipal Trading, by Emile Garcke, M. I. E. E. A paper read before the National Liberal Club Political and Economic Circle, October 24, 1900. Price 6d.

Municipal Finance and Municipal Enterprise. The Annual Address of the Right Hon. Sir H. H. Fowler, G. C. S. I., M. P., President of the Royal Statistical Society, May 15, 1900. Price 1s.

Municipal Trading in England and in the United States. An address by the Hon. Robert P. Porter to the Municipal Trading Committee of the London Chamber of Commerce, October 31, 1901.

Municipal Trading. A paper read by the Hon. Vicary Gibbs, M. P., at the Westminster Palace Hotel, November 19, 1902. Price 6d.

Municipal Trading. Paper read before the Birmingham and District Property Owners' Association by Mr. S. T. Talbot, July 18, 1902.

Notes on the Housing Question in Birmingham, including The Case against Municipal House Building. Price 1d.

Industrial Redistribution: The Crux of the Overcrowding Question. Paper read before the Society of Arts by W. L. Madgen. M. I. E. E., February 12, 1902. Price 6d.

Municipal Trading. An address delivered by James K. Shaw, K. C., L. L. D., County Court Judge of Kerry, before the Statistical and Social Inquiry Society of Ireland, Session 1901-2. Price 3d.

Municipal Socialism. Reprinted from *The Liberty Annual.* Price 1d.

Modern Municipalization. An address to the Paddington Ratepayers' Defense Association by the Earl of Wemyss. Price 1d.

Dangers of Municipal Trading. Speeches by the Earl of Wemyss, the Attorney-General (Sir Richard Webster, now Lord Alverstone, Lord Chief Justice of England), etc. Price 3d.

Fairplay versus Monopoly. Reasons for the supply of cheap Electrical Power by private enterprise. Price 1d.

Municipal Socialism. Series of articles reprinted from the *Times.* Published at the *Times* office, Printing House Square, E. C. Price 6d.

Municipal Trading. An address delivered by the Hon. Robert P. Porter before the British Association, Belfast, September 12, 1902. Published by the Industrial Freedom League, 53 Parliament St., London, S. W. Price 2d.

THE END

CITY OWNERSHIP OF ELECTRIC LIGHTING*

Some Settled Points—Statistical Limitations—Elements of Cost—Question of Comparative Salaries—Commercial Business

By Victor Rosewater

GAS was first introduced in London in 1807, but not generally used for street lighting until after 1817. The electric lamp, as we all know, first found practical demonstration in the exhibit made at the Paris Exposition of 1878. Its introduction and adoption in this country for both private and public illumination is a matter of the last twenty years.

The application of electricity to lighting and its perfection for practical uses came at a peculiar period of our history, so far as concerns the question of municipal ownership. Municipal ownership of various public services had been tried by American cities with varying results. The experience with municipal plants for the distribution of water had been eminently successful, while the few experiments with municipal gas works were still the subject of lively contention. It was a period in which our municipalities were busily engaged in numerous costly public improvements urgently demanded to meet the needs of rapidly growing populations. The defective condition of legislation and the meager powers reposed in our municipal corporations constituted serious obstacles to public ownership and the cities were, therefore, for the most part, helpless, as well as unprepared to take on the new functions such as would have been required by the installation of an electric lighting plant. As a result, for nearly twenty years the discussion of municipal ownership of electric lighting has continued pro and con, and while I believe much headway has been made in the direction of arousing popular sentiment to the advantages of municipal ownership, it must be admitted that public opinion is as yet by no means firmly crystallized.

SOME SETTLED POINTS

I believe we can all agree that several important points have been definitely settled beyond serious dispute.

1. Electric lighting is a monopolistic industry. In the early discussion of municipal ownership the principal argument on the side of the lighting corporations was that all the evils and abuses complained of would right themselves under the beneficent operation of the law of competition. If the people of any city were dissatisfied with the character of the service rendered, or the price charged, all they had to do was to charter another electric lighting company and transfer their patronage to the one that offered the better terms. The history of electric lighting both here and abroad completely discredits this assumption. Nowhere has competition been effective. Everywhere has combination been manifested. Even when competing companies were originally chartered and enfranchised, they have all been merged into one organization, or have divided territory, completely excluding competition. It is needless to go into further details on this point. Both sides will agree that competition in electric lighting is unnecessary and undesirable, that a duplicate electric lighting service for the same territory constitutes an economic waste making necessary higher charges than would be required for a single unified plant. A potential competition exists between electricity, gas, gasoline and other lighting agencies, but competition as a regulative force between rival electric lighting concerns is out of the question.

2. Electric lighting is a public or semi-public rather than a private undertaking. The very nature of the business invests it with a public character. A corporation cannot be launched to go into the business of supplying electricity for light and power on the same plan that a corporation would be formed to embark into the manufacture of farm machinery. The plea that the public has no interest in the conditions under which electric lighting concerns operate has been abandoned. Their exclusive use of a portion of the streets, the menace of their wires to life and property, the interference of their poles and equipment with fire fighting, all constitute points of contact with public needs outside of the matter of quality of service and price regulation. The assent of the municipality is required before an electric lighting plant may be installed and the right of the public through its municipal government to exercise control even where its powers are delegated to a private corporation is fully conceded.

3. Electric lighting is subject to the law of increasing returns. In former discussion much was made of this proposition, namely, that with every additional investment of capital and labor an established plant bears more than a corresponding return from sales of product. The point sought to be scored was that the very fact of increasing returns placed a concern once intrenched, in position to monopolize the field and to bar out all competitors. But the same importance no longer attaches to this thesis because more careful analysis of the industrial organism has demonstrated it to be from one point of view a mere truism and from another simply a measure of franchise value. It has been found that the law of increasing returns does not apply exclusively to monopolies, but is to be discerned, though perhaps within narrower limits, in industries essentially competitive, where it is traceable more particularly to effective industrial organization. That the municipal monopolies of service are susceptible of close and systematic organization goes without saying. Looked at from another standpoint, the law of increasing returns so far as it is accentuated in this and allied fields measures the variations of franchise value. If the area supplied is occupied by a steadily growing population, or by people whose demand for the service is increasing, the increment of profit that flows from expanding business accumulates at a rate in excess of that of increased expenses. Per contra, should the population for any reason fall away, or the demand for the product shrink, or be satisfied with substitutes, the value of the franchise would suffer a more than proportionate diminution.

STATISTICAL LIMITATIONS

When we come to the comparative cost statistics we meet with many difficulties. These difficulties I have already discussed in another place (*American Statistical Association Quarterly*, March, 1893), and I will concede that the best figures that have so far been at our disposal are not to be implicitly relied upon for purposes of close comparison. To undertake to figure out with precision how much, if any, advantage accrues in dollars and cents from municipal ownership as against contracts with private corporations is quite impossible from the data at our command. In the first place, the comparison of contract prices by themselves is often deceptive because the amount of lighting service varies from place to place. In one city the lamps may burn but a few hours nightly on a moonlight schedule, whereas in another they are burned all of every night Again, the length of the contract period is important because in response to an advertisement for lighting bids under contracts for one, two, three, five or ten years respectively, it will be found that the proposals for the different terms will differ very materially. The location of the wires underground or overhead—the location of the lamps in clusters or singly on poles—their distribution over a wide or circumscribed area—all enter into the cost of service and tend to vitiate comparisons of cost between different cities. In the matter of municipal lighting plants, we have as yet no uniformity of bookkeeping by which we may be sure similar entries are made up of the same items. In many cases, moreover, we have a system of joint production in which an electric lighting plant is conducted in conjunction with other monopolies of service (with waterworks, for example), which almost defies statistical separation of cost elements.

The geographical situation also has much to do with determining the cost of the motive power—whether or not water-power may be used, or if steam, the quantity and the quality of the fuel. Still another variant lies in the percentage of depreciation which must always be more or less arbitrary. What I will admit, with refer-

* Courtesy of *Municipal Affairs.*

ence to the use of cost statistics, is that the so-called average cost is deceptive, that it is useless to seek to represent complicated processes by a single numerical figure, that cost statistics, while in themselves most valuable, must be employed as a basis of comparison only with the utmost care with the fullest knowledge of special conditions and with due allowance for the many limitations which affect their accuracy. It must not be assumed, however, that I argue for the discrediting of cost statistics altogether; for they embody the financial experience of the various undertakings, both private and municipal, and our course for the future must be guided largely by the experiments and experiences of the past.

It is not my purpose to spread out an imposing array of figures contrasting public and private lighting plants. The officials of the census bureau have been collecting data relating to electric lighting throughout the country, but their schedules have not yet been tabulated and are, therefore, still inaccessible. When published they will doubtless supply all the materials necessary for a careful study of the conditions as they exist to-day.

Department of Labor Inquiry

The most comprehensive inquiry into electric lighting plants that has been made with any official authority is that of which the results are contained in the fourteenth annual report of the Commissioner of Labor, being for the year 1899. In this report Commissioner Carroll D. Wright and his assistants succeeded in gathering data for 952 plants in the United States, of which 320 were municipally owned and controlled, while 632 were operated under private or corporate ownership.

Realizing the difficulties of handling the statistics and the utter impossibility of finding a single unit to which the product could be reduced, Commissioner Wright divided the plants into groups according to the total horse-power capacity of their engines and classified all his material by corresponding groups. The total investment to the end of the last previous fiscal year in the 320 municipal plants operated was $10,908,929, and that in the 632 private plants was $113,917,815. His final conclusions expressed in the summaries bringing together by groups all the facts which could properly be compared are as follows:

"1. Average price per kilowatt hour charged in arc service: Taking up the average price charged per kilowatt hour by private plants in each group, and comparing it with the average price charged to private users per kilowatt hour by municipal plants, it is seen that in all of the groups subject to comparison except one, the average price charged by municipal plants is smaller than that charged by private plants.

"2. Average price per sixteen-candle power lamp per year charged in unmetered incandescent service: Taking up the average price charged to private users, it is seen that in all of the groups except two, the average price charged by the private plants is considerably in excess of that charged by the municipal plants; while, so far as the electricity used for municipal purposes is concerned, it is seen that, with the exception of three groups, the average cost per lamp per year to the municipality of its own service is very much smaller than the price charged by private plants to the municipality for a similar service, this cost in some cases being less than half the price charged by private plants.

"3. Average price of incandescent service per kilowatt hour to private users: Taking up the figures it is seen that in all of the groups the average price charged per kilowatt hour by municipal plants is less than that charged by private plants.

"4. Average price of incandescent service per lamp hour to private users: An examination of the table shows that this average price is less in every group containing municipal plants than the corresponding groups of private plants.

"5. Average price of incandescent service per ampere hour to private users: The table shows that the average price is less in the municipal plants than in the private, in all of the groups in which comparisons could be made, except one.

"6. Average price per lamp per year of arc lighting, by hours of service rendered: Taking up the price to private users, it is seen that in all of the groups except one, the average price charged per lamp per year is smaller in municipal plants than in the private ones. Comparing the columns showing the average price charged by private plants per lamp per year to the municipality, of lights furnished by municipal plants, it is seen that in all of the groups except one, the cost per lamp per year of lights furnished by municipal plants is smaller than the price charged per lamp per year by private plants to the municipality for the lights used in municipal service."

More Recent Statistics

The work begun in this inquiry by the Department of Labor has been supplemented since by annual reports upon the statistics of American cities, confined, however, to cities having a population of over 30,000, and including statistics of electric lighting only as incidental to general statistics of municipal financial and other activities. Taking the last of these exhibits published in the monthly bulletin of the Department of Labor for September, 1902, and collecting the figures therein on this subject, rearranged to bring out the salient features, we have this table embracing the thirteen cities with over 30,000 inhabitants which own and operate their own electric lighting plants:

City.	Census population.	Plant, when acquired.	Miles mains.	Total number arc lamps.	Cost of plant.	Capital outlay for year.	Maintenance and operation electric plant.
Chicago	1,698,575	1888	850	6,210	$2,234,642	$54,323	$330,716
Detroit	285,704	1895	481	2,055	851,655	25,147	108,244
Allegheny	129,896	1890	269	1,450	406,812	6,756	98.833
Columbus	125,560	1898	*	877	68,911	.....	107
St. Joseph	102,977	1889	109	420	98,752	7,772	24,093
Grand Rapids ..	87,565	1899	101	544	193,309	1,267	23,568
Wheeling	38,878	1892	65	507	135,221	.....	22,771
Little Rock	38,307	1888	43	218	35,557	557	9,866
Galveston	37,789	1894	*	176	65,000	1,353	23,448
Tacoma	37,714	†1893	*	335	502,230	27,352	69,251
Springfield, Ill..	34,159	‡1900	*	460	*	3,572	.....
Topeka	33,608	1888	66	342	77,800	1,018	13,169
Taunton	31,036	1897	65	247	158,242	4,783	29,247

* Not reported. † Built 1887. ‡ Built 1894.

With these unvarnished and uncolored facts and figures before us, we can take up more intelligently the various arguments and assertions on which the advocates of private ownership of electric lighting rest their case.

Elements of Cost

Rightly or wrongly, the first question asked when the subject of municipal ownership is broached is, "Will it pay?" If municipal ownership meant a heavier burden on the taxpayers of the city no other argument could command attention. But should the beneficiaries of private franchises still insist that it is more economical for the city to sublet the task of supplying its electric lighting to a franchised corporation, the answer is that the results of every investigation into comparative cost under private and public regimes contradicts their assertion. In all candor I ask, Why should a private corporation be able to supply electric light more cheaply than a public corporation? Would it be rational to believe, entirely apart from the facts and figures we have already examined, that the elements entering into the production of electricity for lighting purposes come more expensive to a municipal corporation than to a private corporation?

The cost of production may be divided broadly under (1) capital investment and (2) expenses of maintenance and operation. Will any one contend that private corporations can borrow money as cheaply as municipal corporations? When it comes to raising the necessary funds for the capital investment, the municipality can sell its bonds at better rates than the private corporation. In the city of Omaha, where I live, municipal bonds bring a premium that reduces the interest rate down to approximately four per cent., while the public service corporations have to float their securities on a six per cent. basis and often at a discount, and I have reason to believe the same is true generally throughout the country. It is sometimes contended that the municipal corporation will have to pay more for its building sites and construction work and that it cannot buy its machinery and installation materials as cheaply as the private corporation. There is nothing, however, to support this assertion, nor is it plausible unless we assume that the public officers are recreant to their trust and that private corporations are not as liable to suffer from dishonest or scheming employees as the municipal corporation.

The manufacturers of electrical machinery certainly stand as ready to sell to municipal corporations as to private corporations without discrimination as to prices.

Of the expense for maintenance and operation, the principal items are those for supplies and fuel, for wages and salaries, for depreciation and repairs. What I have said with reference to the purchase of machinery applies with reference to supplies. There is no good reason why the municipality cannot buy as cheaply and effectively as any one on the market. These purchases are usually made by contract awarded on competitive bids whether they affect a municipality or a private corporation.

Question of Comparative Salaries

When it comes to the question of comparative salaries and wages, we can cite testimony in the report of the Commissioner of Labor, already referred to, which contains a table covering these points within the respective groups into which the plants are classified, with this comment:

"So far as salaries are concerned the average cost in municipal plants is smaller in every group presented, in some cases being less than half the average cost in private plants. As regards wage costs, it is seen that in seven of the groups shown the average cost in the municipal plant exceeds that in the private plants, while in eight of the groups this cost in the private plants is greater than in those municipally owned and controlled."

From this we would be safe, certainly, in concluding that municipal plants are at no disadvantage.

As to repairs, wear and tear, and depreciation, the ownership of the plant will make no difference unless we take it for granted that the men in control of one class are less efficient and less competent than those in control of the other. Accidents are no more likely, nor the rate of depreciation more heavy on account of the different ownership of the plant.

Commercial Business

In figuring on the financial saving effected by municipal ownership, we must remember that substantially all the private plants engaged in supplying electric light have a large commercial business in addition to their contracts for street illumination. In fact, for most of them, the contract for city street lighting is simply a nest-egg, while the more profitable part of the business consists in selling electricity to private consumers. In some cases private ownership undertakes to furnish street lamps at moderate, or even losing prices, as a consideration for the privilege of exploiting the commercial lighting field. On the other hand, the municipal plant has not always been allowed to engage in commercial business, but very often has been compelled because of legal limitations to confine itself to supplying street illumination for the municipality alone.

In his notable investigation Labor Commissioner Wright feels called upon to explain that in many cases his table (of comparative cost of production) shows that:

"In municipal plants the income from private users during the year exceeded the cost of production and that apparently the city not only obtained free electricity for its own use, but made a profit besides, while in other cases, mainly in the smaller plants, the cost of electricity used by the city was extremely high. In the former cases the prices charged private consumers by the municipal works were sufficiently high to reduce the cost to the city of its own electricity to a very small sum, and indeed in many cases to nothing, in addition to showing a large profit on the service. In the latter cases, in which the cost to the city was apparently large, the condition may be due to one or more of a variety of causes. In some instances a high cost may be accounted for by the fact that a small price is charged to private consumers and the income from this source being very small, the proportion of cost to be borne by the municipality and chargeable against the electricity used for public service becomes correspondingly large; further in small towns and cities where the service is limited the cost of operation is almost as great as would be demanded by a greater amount of service."

In analyzing the table I have constructed from the annual compilations of the statistics of cities already mentioned, I have noted that of the thirteen cities of over 30,000 population, two, namely, Tacoma, Wash., and Taunton, Mass., are apparently unique in doing business on a strictly commercial basis. For the year covered by the September, 1902, report, the city of Tacoma is credited with receipts from sales of electric light aggregating $80,485 for the year. Its expenses of maintenance for the same period were $69,251, so that the city secured all of its 335 street lamps without cash outlay and had, besides, a surplus of some $10,000 to offset the interest on its investment and the depreciation of its plant. According to the same source of information, the plant at Taunton took in a yearly revenue amounting to $29,747 paid for commercial lights, while its expenses of maintenance were $29,247, leaving a difference of $500 in addition to the use of 247 arc lamps for street illumination as an offset against interest charges. To show that this result is not simply an extraordinary condition of a single year, I have compiled from the Labor Bureau's annual bulletins the following tables to show the financial operations of these two municipally owned plants for a period of three years:

Tacoma—Population, 37,714.

		1900.	1901.	1902.
1.	Number miles mains	.....	.....	.....
1.	Number of miles of mains	.....	.....	.....
2.	Total number of arc lamps	.....	318	335
4.	Capital outlay for year	15,887	54,230	27,352
5.	Maintenance and operation	47,798	58,693	69,251
6.	Income from plant	57,114	60,293	80,485
7.	Expenses for other street lamps	.....	.....	.....

Taunton—Population, 31,036.

		1900.	1901.	1902.
1.	Number miles of mains	.....	65	65
2.	Total number of arc lamps	.....	247	247
3.	Cost of plant	$141,743	$149,640	$158,242
4.	Capital outlay for year	9,223	3,759	4,783
5.	Maintenance and operation	24,758	27,299	29,247
6.	Income from plant	38,169	23,399	29,747
7.	Expenses of other street lamps	8,796	8,814	8,066

If these tables show anything, they indicate that it is the lack of revenue from the commercial business that reduces the financial saving effected by municipal plants cut off from private patronage to which the people of the respective municipalities are entitled.

When it comes to efficient service and reasonable prices to private patrons the municipal plant again has the advantage. As the report of the Labor Commissioner declares:

"In municipal plants profit is not usually considered as an object and the prices charged are not so generally fixed as to earn a per cent. on the investment, unless, as is frequently the case, outstanding bonds render interest a charge necessary to be earned."

In another place the commissioner refers to the fact that by far the greater number of private plants show a good profit, the per cent. reaching as high as 60.45 in one instance. That such profits are incompatible with reasonable rates to the public goes without saying.

Summary

The real question then is whether it is better for the municipality to operate its own electric lighting plant or to reserve to itself only the right to regulate with compensation for the franchise either by fixed money payment or profit sharing arrangement. If financial considerations alone were to govern, the answer would depend upon the terms agreed to, although it is hard to see how, if the city may rightfully claim part of the profit on the percentage plan, it may not with equal propriety and justice do the work itself and take it all. But other considerations ought to weigh as well. The city owes it to its citizens, who may be private consumers of electric light, to protect them against exorbitant charges, and it can do this best when it is alone interested as owner and operator. Again, the promotion of civic virtue would strongly counsel the removal, or at least the minimizing of the festering sore of political corruption invariably produced by the barter and trade of valuable franchise privileges. Municipal ownership of electric lighting may have to wait its turn among the many demands urgently pressing upon the resources of our American cities, yet no progressive program of contemporary municipal reform will without it meet the requirements of current popular thought.

PROPER DISTRIBUTION OF STREET LIGHT

Illumination and Candle-Power Not Synonymous Terms—How the Best Results Can Be Obtained—All Lights Should Be Under General Supervision of City

By W. S. Barstow

The lighting of the streets and thoroughfares of villages, towns and cities has recently been exciting attention because of the apparent lack of proper development of past years. The terms "illumination" and "candle-power" have always been synonymous in the minds of the public, until that beautiful example of lighting at the Pan-American Exposition proved the effective results that could be accomplished by a proper distribution with units of small candle-power.

Early Defects of Electric Lighting Still Prevail

When several years ago the electric arc lamp was first used for street lighting, the result, owing to the dense shadows and continual flickering, was, although a brilliant light, a very unsatisfactory illumination. In an effort to correct the defect the lamps were grouped together and suspended from the top of a tall tower placed in the city square, or above the street intersection. This produced a moonlight effect, but the dense shadows cast by the intervening foliage and the very great waste of light, condemned this method after a short trial. The lamps were then arranged over the same area at street intersections, suspended from long, projecting arms so as to hang about twenty feet above the pavements, and this system has remained more or less effective up to the present time.

During this evolution no effort was made toward a permanent or artistic installation, the municipalities and companies being content with short term agreements which did not permit either to enter into any construction calling for a large expenditure of money. Some of the cities of Europe were probably the first to seek a combination of the artistic with the useful, although to-day there are good examples of such in this country in some of the large cities.

Gas lighting, although the predecessor of electric lighting by many years, assumed an air of permanency from the very start, owing no doubt to the necessity of an underground distributing system. The expense involved in the installation of such a distributing plant gave to the companies more or less of a monopoly, and enabled them to expend sufficient of their capital to erect at the outset more or less ornamental fixtures. The original subdivision of gas light as first installed is even at the present time a good example of an efficient method of illumination. The increase in the unit of light by the use of the Welsbach mantle has been a marked improvement which to-day easily meets all the demands of modern service.

All Streets Should Be Well Lighted

A municipality in the lighting of its thoroughfares should never be content with one or two brilliantly lighted business streets, but should strive to secure as well a general efficient illumination over its entire residential and factory districts. The location of lamps, either gas or electric (especially in the residential sections), should be made in the summer time, for if made in the winter, changes will without doubt have to be made, owing to the foliage and resultant shadows.

If gas is used as the illuminant, no more effective lighting can be secured than by placing the lamps every one hundred and twenty-five feet on each side of the streets on the curb line, with two at each street section on diagonally opposite corners. The posts should not exceed ten to twelve feet in height, and they should be spaced so that those on one side of the street are opposite a point midway between those on the other; they should be located so that as few shadows as possible are thrown across the sidewalk or driveway by trees, posts or other obstructions.

If electric lighting has been decided upon, a careful consideration must be given not only to the location of the lamp itself, but to the class of lighting (whether arc or incandescent) to be employed. For residential streets, where there is an abundance of foliage, the incandescent lamp is best suited; the distribution should follow closely that mentioned above for gas lighting. The lamp itself should be placed vertically, hung from socket placed in reflector of a bracket. The average size lamp should be not greater than thirty-two candle-power; excellent results are secured by a standard of twenty-five candle-power.

Within the last year installations have been made with the Nernst lamp, an efficient glow lamp ranging in sizes from sixteen to five hundred candle-power. The light given is soft and diffused, the color more nearly approaching that of the arc than the incandescent lamp. When installed for street lighting, this lamp should be carefully protected from the elements and used with bracket suspension in the same manner as the incandescent lamp. The size of the unit will depend upon local conditions, but as in all other forms of lighting, lamps of small candle-power well distributed will give the best results.

The Arc Lamp Better Suited to Business Streets

For business and resident streets, where there is no foliage, arc lamps are more efficient, especially where a brilliant illumination is desired. In all such cases the enclosed type of arc lamp (that using a small inner and large outer globe) is the more effective, because the light is steady and devoid of all flickering, is evenly distributed and there is an entire absence of all shadows from lamp parts. While in the past, diffusion of light has been attempted with the old style open arc by the use of ground or opalescent glass globes, it has been obtained only at a great sacrifice to candle-power, and in no case has the continual flickering been eliminated.

The proper method of supporting the enclosed arc lamp can best be determined after a study of the locality. Span wire or mast arm suspension, whereby the lamp is brought directly over the centre of the roadway, although not ornamental, is well suited for the lighting of villages or towns, but it will be found that where trees intervene between roadway and sidewalk, dense shadows are often cast. In large cities the mast arm suspension prevails, the length of the arm being varied to suit the local conditions. The practice of placing the lamp directly on the top of the pole is rapidly growing obsolete, as poor distribution is the inevitable result.

In recent years, many municipalities have endeavored to secure an artistic effect in lighting, and in several instances where the municipality itself could not assume the expense, the excess cost has been borne by the residents or merchants. There is no reason why this practice of sharing expense, so common in other city departments, should not apply to lighting and the streets beautified by handsome and permanent fixtures. In some instances at the present time such fixtures, permanent and ornamental, are owned by the municipality, and due allowance for their use made by the companies supplying the service. In other cases, where long term contracts are entered into, frequent adjustment of rates being provided for, the companies have been warranted in attempting permanent construction. In several western cities arches of incandescent lights are used on the business thoroughfares, the expense of which, however, is borne by the merchants themselves, who consider the ornamental feature as a paying advertisement.

But it must not be assumed that artistic and effective lighting can be accomplished only from an underground system with highly ornamented iron poles, for there are to-day many cases where in small towns and cities the expense of an underground system of distribution would not be warranted.

What the Aim Should Be

The aim of the municipality in its street lighting system should be the reproduction as nearly as possible of the diffused effect of daylight, which effect can be approached only by many small, well distributed and located lights, and never by a few single lamps of great brilliancy.

The lighting of public buildings should receive the same care and attention in the selection of lamps and their distribution, and every effort should be made to have the installation a permanent one. The tendency in public building lighting is to employ lamps of higher candle-power than necessary, using thereby fewer lamps in order to reduce the first cost of installation. This policy not only tends to extravagance in the use of the illuminant, but is never productive of the best results. The same careful attention should be given to public as to private enterprises, and especially where the service is continuous and necessarily contracted for on a meter basis.

In recent years there has been a sudden development in commercial lighting along public thoroughfares. The progress of the electric advertising sign has been so phenomenal that to-day in many of the streets of the large cities by extinguishing of the street lamps, for the time being, would hardly be noticed. The encouragement of such lighting is, no doubt, to the public interest, and yet a certain amount of supervision should be exercised by city authorities in order to preserve a general artistic appearance.

In the lighting of its streets, parks or public buildings, the municipality should appreciate the fact that in such lighting, whether by gas or electricity, "candle-power," or, better still, gas or electric energy, is purchased only as a *means of effective illumination*, and that the careful selection and location of the lamps have as much to do in attaining the desired result as the lamps themselves.

COST OF MUNICIPAL VS. PRIVATE GAS

Great Extravagance Shown in Operation of Private Gas Plants—Municipal Plants More Economically Run—Cheaper Gas Under Public Ownership

By Alton D. Adams *

PRIVATE plants in the several states produce gas at average net costs that range, per one thousand cubic feet, between 51.9 cents in Illinois and $3.53 in Nevada. The average capacity and output of plants in each state, their locations as to the supply of raw materials, and the wages paid to labor, have an important bearing on the cost of gas, but these factors are not sufficient to account for the wide variations noted in the net cost of gas. This net cost represents the difference between the total cost of manufacture and the value of by-products per one thousand cubic feet of gas, on an average, for all the private plants in each state. The total cost of gas manufacture, as here considered, includes all sums paid for salaries, wages, materials, rent, appliances purchased for sale, interest (not on bonds), advertising, insurance, repairs, taxes, royalties, and other sundry items.

EXPENSIVE METHODS OF OPERATING PRIVATE GAS PLANTS

The average output of gas, per plant, during the census year, is obtained for each state by a division of the entire number of private gas plants located therein into the total number of cubic feet of gas that all these plants produced in the same period. In the average yearly production of gas per plant, thus determined, the District of Columbia leads the list with an output of 358.4 million feet, while in Nevada, where the gas output per plant was smallest, the figures are 1.6 million feet. Comparing the list of states, it appears that the output per plant gives no certain indication of the cost of gas therein. Moreover, in spite of the oft asserted economy of large plants, those having the greatest average outputs do not show the lowest costs of production.

It should be noted that costs, as here given, include no interest on bonds, dividends on capital stocks, or charges to cover depreciation. Miscellaneous expenses here include all those named as going to make up cost, except materials, wages and salaries. These miscellaneous expenses show much greater variations than either materials, wages or salaries, standing at 6.1 cents per one thousand feet of gas in the District of Columbia, and at 87.8 cents per one thousand feet in North Carolina, and are in many states the largest single item in the cost of gas. As these miscellaneous expenses include royalties and "sundry expenses," it is to be regretted that the census report does not separate these items from the others.

LOWEST AVERAGE COST VERY HIGH

The lowest net average cost of gas per one thousand feet, among the private plants, was that of 48.2 cents in Missouri, though the average production of gas per plant there was only 104.2 million feet, or not one-third of the production in the District of Columbia and less than that in four other states. In New York the average output of gas per plant was 205.4 million feet, and the net cost was 72.8 cents per one thousand feet, or 24.6 cents more than the like cost in Missouri. The sum of material and wages cost was less by 0.9 of a cent per thousand feet of gas in New York than in Missouri, but the charge for salaries plus miscellaneous expenses was greater by 17.5 cents in the former state. Eight states, each having a smaller average output of gas per plant than New York, show smaller costs of production per thousand feet than that in the Empire State. In one of these states, Ohio, the average output of gas per plant was 47.4 million feet, or about one-fourth of that in New York, yet the net cost of gas was only 54.8 cents per one thousand feet, or 18 cents less than that in the latter state.

Even in Indiana, where the average output per plant was only twenty million feet of gas, the cost per thousand feet was kept down to 75.5 cents, or less than three cents above the corresponding cost in New York. This favorable record in Indiana was not due to cheap labor and materials, because both of these items were larger there than in New York. If there be much economic advantage in the production of gas on a great scale, it hardly appears in the net costs of gas in New York, Maryland, Rhode Island, Pennsylvania, New Jersey and Massachusetts when compared with the net costs in Wisconsin, Ohio, Delaware and Indiana, where the average output of gas per plant is much smaller.

MODERATE RANGE IN COST OF MATERIALS

The cost of materials per thousand feet of gas shows, for the most part, only a moderate range. Illinois leads as to low cost of materials, with only 21.1 cents per thousand feet of gas, and this cost is highest in Nevada, where the figure is $1.924 per thousand feet. In only one other state the cost figure for materials reaches one dollar, in only ten states is this cost above fifty cents, and in twenty-three states the cost of materials is less than 40 cents per thousand feet of gas sold.

These differences in the costs of materials are due in part to the different proportions of coal gas and water gas in the products of the several states.

In the manufacture of water gas there are little or no residual products, while with coal gas these products are quite important. The value of residual products is thus some indication of the proportion of coal gas in the output for a state. Water gas, as commonly made, exceeds the candle power of coal gas by less than 25 per cent., though its candle power may be pushed much higher.

Oil gas is manufactured to a small extent compared with the coal and water varieties, and its cost is usually higher, but the candle power of oil gas is frequently between two and three times as great as that of the other two sorts.

THE MATTER OF WAGES CONSIDERED

Wages per thousand feet of gas reached their lowest point at 9.6 cents in Maryland and their highest at 54.9 cents in Nevada. In thirty-three states, wages amounted to less than 30 cents per thousand feet of gas. That the labor cost of gas production in rather small plants is not necessarily high is shown by the figures of 17.4 cents in Ohio, 16.7 cents in Delaware, 18.7 cents in Tennessee, and 21.8 cents in Vermont, per thousand feet of gas, while the like labor costs in the District of Columbia and New York, where the average production of gas per plant was greatest, amounted to 18.8 cents and 17.7 cents per thousand feet respectively.

Salaries show much greater variations than do wages per thou-

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sand feet of gas, being down to 4.3 cents in Missouri and up to 91.5 cents in Nevada. In the District of Columbia and in Illinois the output of gas per plant was much larger than that in Missouri, yet the amount paid as salaries in the latter state was only one-half as great per thousand feet of gas as the like amounts in the other two cases. In New Hampshire the salaries amounted to 11.9 cents per thousand feet of gas, and in Texas, where the average output per plant was very nearly that of the northern state, the salary charge was 26.7 cents per thousand feet. A number of similar instances may be pointed out where salaries per thousand feet of gas differ widely for plants of nearly equal outputs.

The Relation of Salaries and Wages

The relation between salaries and wages in the several states is especially notable. In Missouri salaries were only 24 per cent. of wages, while in Illinois and Maryland, where the average output of gas per plant was much greater, the percentages of salaries to wages were 59 and 61 respectively. Salaries were 50 per cent. of wages in Colorado, but in Louisiana, where the average output per plant was nearly equal to that in the former state, 91 cents were paid in salaries for each dollar paid as wages. The average outputs of gas per plant were nearly equal in New Hampshire and Texas, but in the latter state a dollar was paid as salary to correspond with each dollar paid as wages, while in the former state salaries were only 42 per cent. of wages. Laborers received 24.9 cents for each thousand feet of gas made in Mississippi, while 28.7 cents were paid as salary to officials of the companies. In Nevada, when the man who performed the labor of gas making received one dollar, officials of the companies took $1.66 for their trouble.

Municipal Plants More Economically Managed

Nine states contain municipal gas plants, and these plants present some interesting contrasts with those owned by private corporations. In each of seven states the net cost of gas in municipal plants was below the cost in the private plants of any state where the average output of gas was not greater than that in these municipal plants.

The largest salary item per thousand feet of gas in municipal plants was 27.3 cents in contrast with the 91.5 cents paid by the private plants of one state. Only two states show salaries equal to wages in municipal gas plants, and in six states these salaries ranged between 4.6 and 8.5 cents per thousand feet of gas. The net cost of 52.6 cents per thousand feet of gas in the municipal plants of Ohio was below the cost in private plants of any state, except Illinois and Missouri. In West Virginia the net cost of 44.4 cents per thousand feet for gas in municipal plants was below the net cost in the private gas plants of any state.

Average Cost of Gas per 1,000 Cubic Feet in All Private Plants of Each State

	Million feet produced per plant.	Materials per 1,000 feet.	Wages per 1,000 feet.	Salaries per 1,000 feet.	Miscellaneous expenses per 1,000 feet.	Total cost per 1,000 feet.	Value by-products per 1,000 feet.	Net cost per 1,000 feet.
		$	$	$	$	$	$	$
District of Columbia..	358.4	0.338	0.188	0.098	0.061	0.685	0.021	0.664
New York	205.4	.282	.177	.063	.243	.765	.037	.728
Illinois	177.2	.211	.139	.082	.111	.543	.024	.519
Maryland	128.6	.340	.096	.059	.189	.684	.005	.679
Rhode Island	127.6	.318	.325	.065	.278	.986	.093	.893
Missouri	104.2	.290	.178	.043	.098	.609	.127	.482
Pennsylvania	98.8	.358	.171	.051	.126	.706	.035	.671
New Jersey	80.7	.286	.249	.099	.391	1.025	.044	.981
Minnesota	72.8	.403	.223	.064	.187	.877	.075	.802
Massachusetts	71.5	.352	.173	.081	.245	.851	.080	.771
Colorado	69.2	.354	.156	.078	.289	.877	.176	.701
Louisiana	68.1	.347	.198	.181	.509	1.235	.053	1.182
Connecticut	49.9	.345	.220	.112	.317	.994	.085	.909
Wisconsin	47.7	.269	.225	.074	.221	.789	.124	.665
Ohio	47.4	.255	.174	.080	.202	.711	.163	.548
Nebraska	41.2	.405	.240	.111	.405	1.161	.010	1.151
California	41.0	.533	.256	.137	.565	1.491	.208	1.283
Delaware	40.3	.265	.167	.095	.207	.734	.145	.589
Georgia	37.7	.313	.204	.124	.461	1.102	.123	.979
Tennessee	31.3	.392	.187	.118	.338	1.035	.221	.814
Michigan	30.4	.264	.260	.126	.337	.987	.145	.842
Kentucky	27.2	.303	.272	.114	.438	1.127	.226	.901
South Carolina	24.8	.386	.303	.117	.460	1.266	.149	1.117
Washington	23.0	.446	.304	.184	.586	1.520	.126	1.394
Virginia	22.0	.358	.208	.103	.315	.984	.065	.919
Indiana	20.0	.334	.225	.116	.240	.915	.160	.755
Iowa	18.4	.427	.247	.147	.542	1.363	.112	1.251
Maine	18.3	.444	.229	.176	.364	1.213	.171	1.042
New Hampshire	16.4	.404	.281	.119	.611	1.415	.130	1.285
Texas	15.6	.547	.268	.267	.325	1.407	.275	1.132
Oregon	13.5	.779	.277	.203	.343	1.602	.253	1.349
Alabama	11.1	.415	.257	.250	.443	1.365	.233	1.132
Kansas	10.2	.601	.279	.147	.233	1.260	.174	1.086
Arkansas	10.0	.574	.324	.247	.367	1.512	.103	1.409
Mississippi	7.3	.456	.249	.287	.642	1.625	.129	1.496
Florida	7.1	.529	.308	.208	.069	1.111	.071	1.040
West Virginia	5.6	.327	.271	.067	.256	.921	.074	.847
Vermont	5.1	.562	.218	.181	.388	1.345	.019	1.330
North Carolina	4.6	.804	.306	.313	.878	2.301	.137	2.164
Arizona	2.4	1.102	.402	.285	.718	2.507	.024	2.483
Nevada	1.6	1.924	.549	.915	.640	4.028	.492	3.536
Municipal Plants:								
West Virginia	107.6	.185	.297	.046	.084	.612	.168	.444
Virginia	57.6	.294	.223	.077	.101	.695	.050	.645
Ohio	37.3	.317	.139	.085	.065	.606	.080	.526
Minnesota	25.3	.302	.178	.059	.392	1,021	....	1,021
Kentucky	12.7	.586	.216	.071	.305	1.178	.183	.995
Massachusetts	8.8	.588	.166	.085	.244	1.083	.265	.818
Missouri	4.1	.279	.072	.189	.073	.613	.072	.541
Michigan	1.8	.645	.358	.271	.316	1.590	....	1.590
Nebraska	1.8	.717	.230	.273	.904	2.124	....	2.124

METHODS OF HIGHWAY CONSTRUCTION

Concerning the construction of public highways there are five points to be taken into consideration according to Mr. Sam Huston, C. E., of Steubenville, Ohio. These are location including grades, drainage, foundation, surface and maintenance. As a rule, the location of roads as they are found, is not to be commended. Roads were originally located with an extremely heavy grade up a point and then along a ridge because of the ease and cheapness with which they could be constructed. Since the improvement of roads was started in a general way some eleven years ago, the people have been educated in the line of road building, especially with reference to location. Mr. Huston thinks that the state of Ohio should strike from its statutes the implied sanction of the idea that a road of five per cent. to seven per cent. is a practical one on which to place macadam and he asks that a State commission be obtained which should have the right to reject any new road or alteration that did not accord with the principles of good engineering. New Jersey has endeavored to bring the grade of all its improved roads within seven per cent. The Massachusetts Highway Association in 1899 allowed a maximum grade of six and one-half per cent. and the report of the State Engineer of New York for the same year gives five per cent. as the maximum grade. In Europe the practice is to limit all roads, as far as possible to from five to seven per cent.

A heavy grade is detrimental to the road surface for the action of the horses' feet in drawing heavy loads tends to break up the bond and disturbs the surface. Going down hill the action of locked wheels is equally detrimental, while heavy rains play havoc with the wearing surface. Thus, while the paramount objection to the heavy grade is the great expenditure of motive power in hauling loads, it should not be forgotten that a large element is the cost of maintenance. While a heavy grade is not to be desired for any road a road built with a dead level is also hard to maintain on account of the lack of perfect surface drainage. Experience has proven that a road with a 1 per cent. grade is the best.

Referring to the subject of drainage, Mr. Huston gives as the proper crown for a road one foot in twenty-four. This will carry the water on the surface to the side drains, which should be large enough to quickly remove any usual rainfall.

A foundation of firm clay well drained and rolled, is sufficient in most cases. Inasmuch as trap rock is not available in the county in which Mr. Huston has built roads, he was compelled to use coal measure limestone, which had a good cementing quality but was very soft. This was broken to two and one-half inch rings, well rolled and with only enough binder to form a solid bed and smooth surface. In some places he used a fire-clay surface with fire-clay curb, because the fire brick was very cheap in that locality.

One of the most neglected elements in road building, but one of the most important is the subject of drainage. Well made ditches kept in good condition by constant care are the secrets of good roads.

GOOD ROADS IN EMPIRE STATE

Great Increase in Road Building—Bond Issue of $50,000,000 Suggested to Push the Work—Wide Tires Save the Roads—Convicts Can Be Used in the Work

LAST year saw a boom for good roads in the Empire State never before witnessed and the work of improving the highways is destined to increase in amount until all the principal highways of the State will be macadamized. The number of miles of road completed last year, according to the report of State Engineer Edwin A. Bond, was nearly double the amount completed in the three years preceding, being 97.35 miles. For the years 1899, 1900 and 1901 the total amount was 59.33. In addition to the number of miles of road completed in 1902, about ninety miles have been built last year on incompleted contracts and were not included in the total amount given.

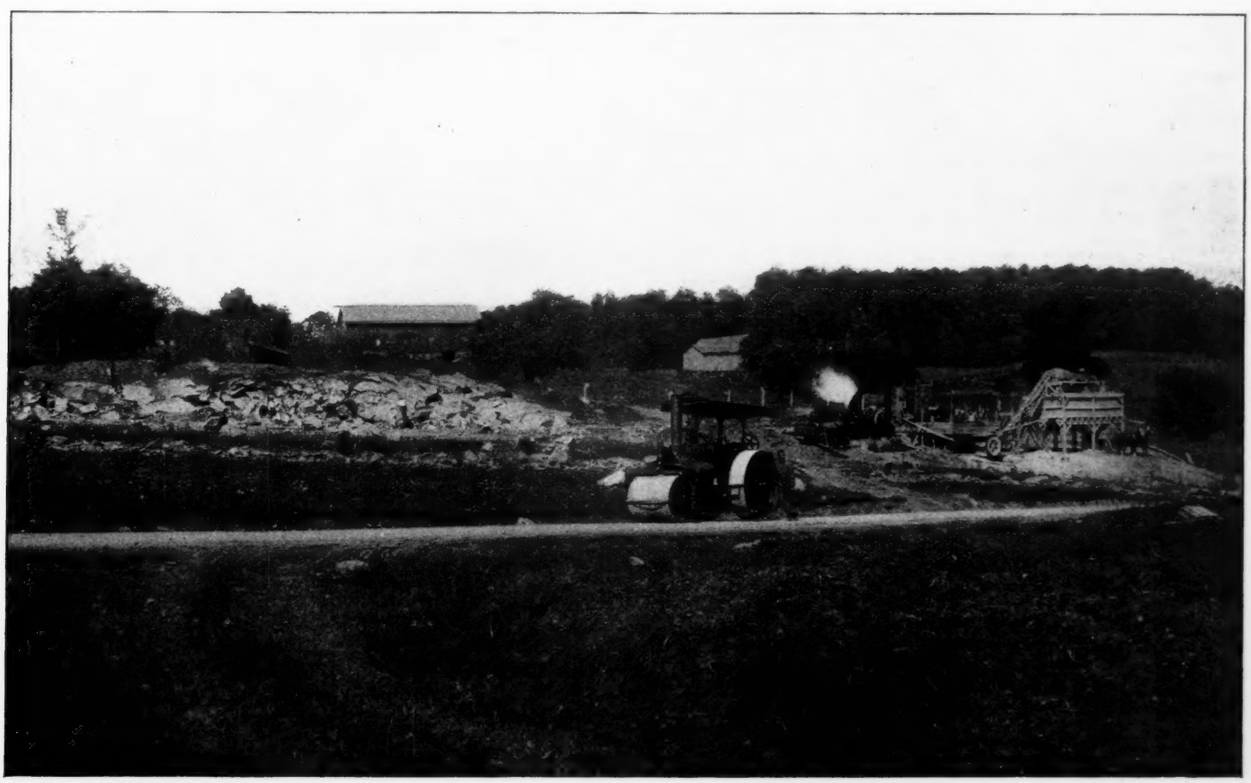
Petitions were received for 401 roads from forty-three counties aggregating 2,007 miles. Surveys were made of 277 of these roads in forty counties having a mileage of 1,159 miles and they will be built as fast as the funds are available. Of the amount, however, 115 of the roads have been completed or are being built, the total length being 317 miles and the average cost $8,819 per mile. In addition surveys, plans and estimates have been made and the counties' half of the estimated cost has been appropriated by the boards of supervisors for ninety-nine roads having a mileage of 339 miles and an average cost per mile of $8,212. Other roads are being surveyed and estimates are being made and they will be built as soon as the money is available. One half of the cost of the roads completed will be paid from the sum of $1,465,000, the total amount appropriated by the Legislature during the five years since the passage of the law, March 24, 1898.

SCIENTIFIC ROAD BUILDING GAINING GROUND

As was anticipated, when once a strip of good road was constructed in a section, the manifest advantages accruing from it to the farmers in the neighborhood whetted their appetites for more and advocates of the work did not have the trouble previously encountered of securing petitions for extensions of the improved road. The farmers had practical demonstration that improved roads benefited them as much and more than any other people and enabled them to keep in touch with the towns instead of being isolated by mud during the wet seasons of the year. The old time-honored idea of working out their road tax by devoting two or three days a year to ploughing up the ditches and dumping the sod and dirt onto the road is gradually being eliminated from the rural districts and scientific road building is taking its place.

Whenever petitions have been received for roads, an examination was made to determine the character of the rock and its extent in the localities affected and samples and descriptions of the same were filed in the office of State Engineer Bond, for future reference. Mr. Frank D. Lyon is the special examiner of highways, his duties being to report on the availability of material for road construction, the amount of travel, material forming the surface of the traveled road, and information as to whether the public interest demands that the improvement should be made and as to whether the State should incur the expense of making the preliminary surveys. Agreements were often made with property owners adjoining the proposed road to be improved to furnish material from their lands, rights of way, use of land for storage of material, water rights, etc. In this way reliable data was placed in the hands of the engineers on which to base their estimates of the cost of the proposed roads.

At times requests are made for a cheaper road than is usually built and State Engineer Bond then acts under the provisions of the law of 1898, which allows him to use his discretion as to the character of improved road to construct, taking into consideration the climate, soil, and materials to be had in the vicinity and the nature of the traffic. Thus, often the roads are built of the best of the



BRIARCLIFF-ECHO LAKE ROAD IN WESTCHESTER COUNTY, N. Y., DURING IMPROVEMENT, SEPTEMBER, 1902

local soils and gravels which were well spread on the roadway after the same had been properly shaped and drained. These are not macadam roads but are better than the ordinary highway and amounted to less than one-third of the cost of macadam roads, running from $2,000 to $3,000 a mile. Later, if it is desired to macadam these roads, all the preliminary work has been done, including the grading and ditching, and the cost of macadamizing is then greatly reduced.

The Use of Wide Tires

When the advantages of wide tires are appreciated by the people, the narrow tires are abolished and those substituted that will improve the roads instead of ruining them. They realize that it is expensive to expend large sums in building good roads and then cut them up by the use of narrow tires. Once wide tires are introduced, the people never revert to narrow ones. Experiments made with wide and narrow tires on all kinds of roads, on meadows, stubble, pastures and ploughed land, show a percentage of from 17 to 120 per cent. in favor of wide tires. In 1899 a law was passed in New York State empowering the boards of supervisors to enact local laws relating to the width of tires on vehicles carrying weights of from 1,500 pounds upwards. Several counties have such laws and their beneficent effects on the condition of the roads appreciated. Tests with wide tires at Missouri Agricultural College showed that, with tires one and one-half-inches wide the draft necessary to pull a wagon carrying 3,665 pounds, amounted to 439 pounds, while with tires three inches wide the draft was only 310 pounds. The test was made on wet turf and the wide tires did not injure it as did the narrow. The Vermont Highway Commission worked out a scheme to regulate the width of tires in relation to the weight of load and concluded that the maximum weight, including the wagon, should be 2,200 pounds per inch width of tire. Vehicles having suitable springs could increase the amount of load one-third. European countries have given this matter close attention. In Austria wagons built for loads of two and one-fourth tons must have wheels with tires at least four and one-third inches wide and if built for more than four and one-half tons, rims at least six inches wide. In France the tires of freight and market wagons are from three to ten inches wide and usually from four to six. On four wheeled vehicles the tires are not less than six inches as a rule and the rear axle is about fourteen inches longer than the front axle. Every such wagon is a road maker. In Germany the wagons for heavy loads must have tires at least four inches in width. Were the wagons in this country equipped with wide tires, the draft on the horses would be less and the wagons would serve as road preservers instead of road destroyers as is now the case.

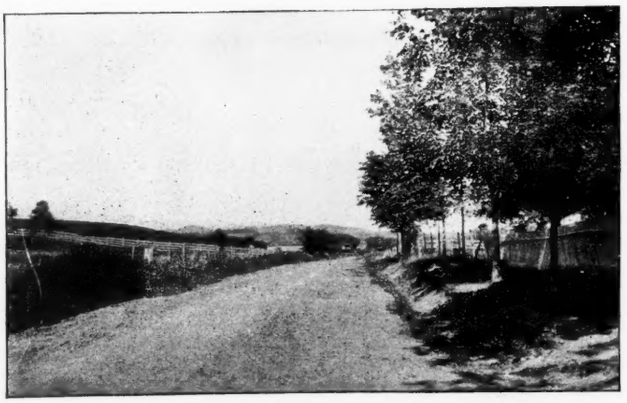
The state engineer's department has also connected with it a cement testing laboratory where tests are made of cements for use in the engineer's work as well as for the state architect and for municipal work. Tests are made for tensile strength, fineness and initial and hard set. The hot water test previously omitted in many cases, was applied to all during 1902. The number of failures to meet the department's requirements were much larger than for several years. In one case a so-called "high-grade Portland cement" was found to be a very poor grade of "slag" cement. Of the cements tested, 82 per cent. were Portland and 18 per cent. natural cement, nearly all of the natural cement being used in the department of the state architect. In February, 1901, some concrete blocks were made up into six-inch cubes and in the proportion of one part Portland cement, two and one-half parts natural sand, and five parts broken stone. They were placed out in the freezing weather and have been left outside since that date. As yet no signs of disintegration have appeared, the edges being still sharp and hard.

Convicts Should Aid in Road Building

State Engineer Bond repeats in this report what he has urged in previous ones in regard to the use of convicts on highway improvement. Taking for granted that it is better for the convicts that they should be employed usefully in place of being kept in idleness, he suggests that the State open a quarry across the Hudson river from Sing Sing, where an abundance of trap rock is located. Stone-crushing machinery should be installed there and the convicts be put

CONDITION, APRIL 1, 1902

IN PROGRESS, JUNE, 1902



COMPLETED, JULY 23, 1902

TROY-BRUNSWICK ROAD, RENSSELAER COUNTY

to work preparing stone for use on the roads in the State. The rock could be delivered at the wharf and thence transported in cars or boats to sections where needed at one-third the price now charged by private quarries along the river. Special rates could be arranged with the railroads, inasmuch as the latter are to gain by improved highways which form tributaries to them. This plan would avoid the objections raised against the use of prisoners in building roads, they could be as carefully confined as in the prison and would give to the citizens of the State some return for their maintenance, inasmuch as contractors could afford to give reduced prices for road building if they obtained their material so cheap.

To Bond for Improved Roads

It has been suggested that some method be adopted to improve

CONDITION, APRIL 1, 1902

IN PROGRESS, JULY, 1902

COMPLETED, AUGUST 5, 1902

TROY-BRUNSWICK ROAD, RENSSELAER COUNTY

within a few years such part of the main roads in the State as would prove of the greatest benefit to the largest number of citizens. The present rate of road building is not sufficiently rapid to secure this desired result, and to carry out the work much more rapidly would necessitate a large burden in the way of taxes. Since the work is not of a temporary character, but will, with proper attention, last for ever, an issue of bonds could be made. This would allow of the work being done at once, and would distribute the cost over a number of years, allowing the future citizens to help pay for improvements that they would be able to enjoy. The counties' share in the work could be returned to the State in payments extending over a term equal to that of the State bonds. There are about 75,600 miles of highways in the State, of which about 10 per cent. are important enough to receive prompt improvement under State aid. It would cost $60,000,000 to improve these 7,500 miles of road. The State should issue $50,000,000 in bonds to run fifty years. The county seats of nearly all the counties in the State could be connected by 1,250 miles of road, and the 10 per cent. of all roads would allow of the construction of this connecting highway and over 6,000 miles additional for roads at needed points. This would show the public the blessings of good roads and allow them to judge whether to continue the work in this way or adopt other methods. It is shown by those that have studied the farming interests of the State that the returns from the farms are not what they should be, but the rapid extension of the trolley lines and the improvements of highways will stop the trend of people towards centralization in cities and build up the country districts. This movement has already begun and can be traced to these very agents.

Improvements of the Highways

The work of improving the highways of the State is divided into three sections, known as the "eastern," "middle," and "western" divisions, each in charge of a division. In the eastern division there have been sixty-six roads under contract during the past year, with a total length of 209 miles, and at an estimated cost of $1,468,345. The excessive rainfall that occurred during the season delayed the work seriously. The Troy and Brunswick road shown in the two sets of illustrations is in the Eastern division. This has a length of 3.05 miles and a width of fifteen feet of macadam. The whole roadway is from twenty-two to twenty-five feet in width. The work was started on it in April, 1902, and the amount completed by the first of October was 89 per cent. Crushed local quartzite was used on both courses of the road and sandy loam and quartzite screenings for the binder. This road forms part of the principal highways leading into the New England States, and has a very heavy traffic. About sixty years ago it was macadamized, but had grown very rough from lack of care.

The Briarcliff-Echo Lake road has a length of 2.65 miles, a width of macadam of twelve feet and of roadway of twenty-two feet. The estimated cost of the road was $22,540. It will form part of the west side highway across the county of Westchester. The bottom and top courses were built of local granite rock and the screenings for the bottom course were of local stone and for the top course half limestone and half local stone.

The middle division comprises the fifteen counties of central New York, and during the past year petitions for 255,059 miles of road were approved by the State Engineer. The rainy season interfered with rapid progress and only about twelve miles of road were completed during the year. A firm sub-grade is necessary for a six-inch macadam roadway, and it does not do to lay the stone on mud.

In the western division the rain also prevented much progress in road building. The sub-grade would hardly dry out, so that the stone could be laid between showers. The work was, consequently, disorganized and could not be carried out on well defined plans. Labor was scare despite the offer of 20 cents an hour and such bonuses as street car fares. Plans for some of the roads were made in dull times, and so the prices of prosperous times made necessary a revision of the plans that the work might be done within the amounts available. Local stone was often used in place of trap rock to reduce the expense. In place of pipe culverts those of concrete reinforced with expanded metal were used.

It was found that the plan of dividing the work of the division into sections, over each of which an assistant engineer was placed, had many disadvantages. It were better to place one man in charge of one road, whatever its length. The engineer in charge of the western division does not believe in any of the various types of wheel tracks at present being advocated in some quarters. The idea that larger loads can be hauled on these is, to him, a fallacy. A well-kept macadam road will allow of just as large loads being hauled for the same amount of power. The smooth track does not afford sure footing for the horse, and the gain in ease of traction is more than offset by the reduced pulling power of the animal. They also hasten the destruction of the rest of the road, because all wagons are not of the same width, and ruts are formed on both sides of the tracks.

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Absurd Provision of New York's Charter

A RECENT court decision relative to the use of a patented pavement calls attention to the absurdity of a provision of New York's charter. Although this section, in one form or another, has been in operation for more than thirty years, it has never before received the interpretation given to it by Justice O'Gorman. As the principle involved is of general interest, we comment upon it somewhat at length.

Some months ago the attention of President Cantor was called to a form of pavement known as bitulithic. As it was a comparatively new pavement, he was unwilling to lay a large quantity, but, in his judgment, deemed it wise to provide for the repaving of at least two blocks for the purpose of demonstrating its value. Bringing the matter before the Board of Estimate and Apportionment, his judgment was confirmed, and he was authorized by the said Board to advertise for bids for the laying of a certain number of square yards of this pavement on Seventh avenue. This action no sooner became known to the public than the antagonism of the asphalt trust was aroused, and, through The Barber Asphalt Company, action was brought against the city and Borough President Cantor, whereby a temporary injunction was issued by Justice Blanchard, restraining the defendants from entering into any contract for the use of this form of pavement.

Subsequently the matter came before Justice O'Gorman for decision as to the continuance of the temporary injunction, it being contended by the counsel for the plaintiff that the proposed contract violated the provision of the charter relating to the use of patented articles. In sustaining this contention, Justice O'Gorman said:

"Section 1554 of the charter was clearly intended to absolutely prohibit the laying of a patented pavement except for the purpose of repairs. No other construction is reasonable or permissible. The section is to be read as if a semicolon followed the words, 'except for repairs, no patented pavement shall be laid.' The words 'patented articles' to which the second exception relates might ordinarily be broad enough to embrace a 'patented pavement,' but the Legislature has made a manifest distinction between them, and giving effect to the legislative intent 'patent pavement' as used in the statute is not included in the term patented article.'

"The provision prescribing the conditions under which a 'patented article' may be 'advertised for, contracted for or purchased,' can have no application to the laying of a patented pavement."

Not long after, an injunction was granted in the borough of Brooklyn, restraining the authorities of that borough from laying an asphalt block pavement which had been duly contracted for, it being granted upon the same ground referred to in the decision of Justice O'Gorman, which simply emphasized the absurdity of the above decision, as asphalt block pavement has been laid for years, without previous opposition, in the boroughs of Manhattan and Brooklyn, and doubtless would have been laid for years to come, without hindrance, were it not for the petty tricks of the trust to further its own ends. Until this decision of Justice O'Gorman is reversed by the higher courts, it will be impossible for Greater New York to avail itself of the use of any pavement which may be patented, even though it were demonstrated in the most satisfactory manner that it could be laid for one dollar, or less, per square yard.

The motives of the plaintiff, in the original action, may have been pure and patriotic, but the facts in the case do not bear out such a supposition, for no claim of fraud is made, nor is it asserted that the pavement which Borough President Cantor sought to lay was in any way defective. The tactics of the trust in the past are too well known to permit of any other assumption than that it is seeking to further its own selfish ends.

Corporation Counsel Rives submitted an argument in appeal from the decision of Justice O'Gorman last month, and there can be little doubt but that the decision will be reversed by the higher courts. Mr. Rives, in his argument, traced the history of this particular section of the new charter, and showed that it had been in operation for more than thirty years; that it had been enacted substantially in its present form as a part of Section 115 of Chapter 335 of the laws of 1873. Although cases have repeatedly arisen in the past bearing upon this section of the charter, no such interpretation as that given by Justice O'Gorman was ever rendered by any court.

For this reason the decision is the more surprising, especially as it could not have been logically reached without the arbitrary introduction of a semicolon into the section quoted, thus altering the real intent and purpose. The section reads as follows: "Except for repairs no patented pavement shall be laid and no patented article shall be advertised for, contracted for or purchased, except under such circumstances that there can be a fair and reasonable opportunity for competition, the conditions to secure which shall be prescribed by the board of estimate of apportionment."

We may not have a judicial mind, but if ever the English language expressed anything at all, this section certainly grants the right to the Board of Estimate and Apportionment to determine what circumstances are fair and what competition shall be reasonable in contracting for or purchasing any kind of patented pavement, as well as any patented article. If it had been the purpose of the framers of the charter to prohibit the use of any patented pavement except for repairs, it would have bluntly said so. The object of the provision was to prevent exorbitant charges for any patented article supplied the city, whether it be a pavement or otherwise; and the fact that no waste of public property or funds involved was charged by the plaintiff, the fact that there was no allegation of fraud, makes the decision appear more unreasonable and ridiculous.

In a commendable endeavor to conserve the public good, by preventing the looting of the public treasury, the framers of charters often defeat this purpose by the adoption of too restrictive measures. We believe that city authorities should be permitted to administer the affairs of their departments in a business-like manner, but a restriction such as that read into this section of New York's charter, makes it impossible.

Civic Ownership of Lighting Plants

SHOULD the city or a private company own and operate electric light systems for street illumination and commercial purposes? is one of the important questions of the day. It is not a political, but a business proposition, although the opponents of municipal ownership maintain it to be impracticable because of politics.

The cost of lighting cities in the United States varies widely, ranging from twenty-six dollars per arc lamp, per year, in Pueblo, Colorado, for all night service, to one hundred and eighty dollars per arc lamp, per year, in Aanaconda, Montana, for the same service. When the local conditions surrounding the various prices are analyzed, the reason for the difference in the price per arc lamp is often seen to be justifiable.

It is a recognized fact in all kinds of engineering that "conditions alter cases," and that local environment must be considered in all instances. Like the doctor in diagnosing a case, the electrical engineer must study the symptoms before attempting to reach a definite conclusion.

When the question of municipal ownership first arose, many citizens based their argument against it on the supposition that because it was a public enterprise it would be extravagantly operated, and that, therefore, the cost of lighting would necessarily be high. Even granting the correctness of this supposition, the number of poorly financed and operated private plants are the rule rather than the exception. It must be remembered, also, that municipal plants are subject to far more criticism than private plants, whose accounts are seldom seen by even their own stockholders, and whose success is always measured by the prevailing rate of dividend. After carefully weighing all the conditions surrounding the construction and operation of municipal and private plants, it is fair to conclude that both propositions may be considered from a purely business basis; furthermore, that politics can be eliminated from that of public ownership.

The cost of furnishing street lighting may generally be divided into two parts: First, that which is based on the item of first cost, and which is independent, to a large degree, of the amount of service furnished; second, that which varies with the amount of service furnished. Included in the first is interest on money invested, insurance, local expenses, depreciation of property, and taxes—the latter should be included in municipal as well as private plants. In the second classification of expense should be included fuel, oil, waste, water, labor, etc., etc., which expenses are governed by the actual output of the plant. The first expense is fixed by the maximum capacity of the plant, whether lights are operated one or twenty-four hours, one or three hundred and sixty-five days in the year; the second expense varies with the number of lights actually supplied and the hours of burning. There is, therefore, depending upon the first expense, a fixed charge per lamp per hour, whether the lamp is operated or not, and, what might be termed, an additional charge which varies according to the number of lamps and time of their operation; so that it can be readily understood why the total cost per lamp is largely dependent upon the conditions of service.

Another fact which is often lost sight of is that the first expense, or the fixed charges, varies in localities according to local conditions, such as the kind of distributing system—whether overhead or underground, etc. The second expense, or operating charge, depends upon the prevailing rate of labor, the cost of fuel, oil, water, and the various minor items which enter into the operation of the plant.

From the foregoing, therefore, it will be seen that even from a business standpoint the problem is complicated, and made more or less difficult by local conditions which affect municipal and private plants alike.

As the operating cost and efficiency of a plant depend upon the number of hours that its machinery is actually operated, the question of demand must be carefully considered. On a basis of the average number of lamp hours per lamp per day being eleven, it will be understood that the entire machinery of the power plant, when furnishing only public lighting, will be idle the greater part of the time. If this same machinery could be kept in operation during the balance of the twenty-four hours—half the time on public street lighting and the other half for commercial lighting—it can be easily apprehended that the fixed charges per lamp for public lighting would be less than if the plant were idle half the time, disregarding, entirely, the question of economy of operation. This "condition of service," therefore, is the essential point to be considered in the question of municipal ownership.

If the conditions of the municipal plant coincide in all particulars with those of the private plant, then municipal ownership will be favored to the extent of the net earnings of the private company, which are paid back to its stockholders in the form of dividends, as these dividends would then go to the taxpayers in the form of a reduction in the actual cost of public lighting. Many so-called municipal lighting failures are due to mismanagement. For instance, in order to prove to the critical public at the very outset that a municipal plant is successful, depreciation charges, and sometimes interest and insurance, have been omitted; hence large proportionate earnings have been shown during the first years of operation than during the latter period. Where such practice prevails, the invariable result follows, namely, the commissioners have on their hands a lot of antiquated machinery and a system which requires extensive remodelling, all of which can only be secured by the issuing of additional bonds; whereas, if an equitable sum had been set aside each year for depreciation, the extra expense would have been unnecessary. It may safely be said that under similar conditions of cost and supply, a municipal plant would be as successful, in almost any city, as a private plant, if it were operated free from politics and on a business basis. Recent exposures of corruption through private corporations have demonstrated the verity of this conclusion. If we could only have a law, faithfully enforced in every municipality, which would mete out equal punishment to bribe-giver and bribe-taker, the profits derived by the people from municipal ownership would soon be largely increased.

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The Question of Public Lighting

In this number of the Municipal Journal and Engineer we devote a large amount of space to the question of public lighting, and have been fortunate in securing articles by those who are competent to deal with the subject. Mr. Victor Rosewater, of Omaha, discusses "Municipal Ownership and Electric Lighting," presenting strong argument in favor of public ownership and operation. Mr. W. S. Barstow, of New York, takes the subject of "The Proper Distribution of Street Lighting," which has received but little attention heretofore. It contains a lot of common sense, which we commend to the careful consideration of our readers. There is little doubt that if Mr. Barstow's suggestions are followed out there will be great saving in the expense of lighting our numerous cities. Mr. Augustine Davis, of Chicago, deals with, "Town Lighting by Acetylene." He shows its special adaptation to small towns and villages—those having a population of 5,000 or less. There is little doubt that much money is wasted in lighting small towns and villages. Better results at a lower rate could be secured by the use of acetylene, as suggested by Mr. Davis. Mr. Alton D. Adams, of Boston, who is well known to our readers, deals with a phase of the gas lighting question which cannot fail to be of general interest. The usual amount of statistical matter upon the lighting question will also be found in this number, making a number which is easily worth the price of a year's subscription to any wideawake city official.

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The Most Notable Good Roads Organizations

The two most notable good roads organizations in the country are the American Road Makers and the New York and Chicago Road Association, of which we have had considerable to say in former issues of the Municipal Journal and Engineer. Each has a definite purpose for its object and each is achieving some degree of success. The former is employing every legitimate means for crystallizing the wide-spread sentiment in favor of good roads into some workable form or system for each locality and state, at the same time advocating the appointment of a national commission, the chief object of the latter being to further the interests of the good roads cause in every state and territory by the wise administration of the affairs of the Bureau of Good Roads Inquiries, after it shall have been allowed an appropriation adequate to the need. The New York and Chicago Road Association has recently been incorporated and expects soon to make a careful survey of the first one hundred miles leading out of New York, at the same time arranging for a similar survey, beginning at Chicago and working

east. Under the leadership of Col. Albert A. Pope, President, and Mr. Arthur H. Battey, Secretary, satisfactory progress is being made. We have only words of commendation for both organizations and best wishes for their future success.

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Another Coat of Whitewash for Sturgis

COMPTROLLER GROUT some time ago preferred charges against Fire Commissioner Sturgis, in which it was shown that the law had been violated. In the course of events, these charges finally came before Mayor Low for his decision. While the Mayor admits that there was a technical violation of the law by Commissioner Sturgis in connection with the engine house contracts, he declines to remove the head of the fire department, on the ground that he is an efficient commissioner, and that no further lapses will occur, now that the law on the subject has been clearly defined. If Mayor Van Wyck had rendered such a decision there would have been a wail from the reformers that could have been heard across the Continent.

The Mayor's decision is simply a case of whitewash; but it is not the first time that he has used whitewash in connection with his Fire Commissioner. *The Evening Post,* in commenting upon the affair said:

"It is a poor excuse for a public officer, detected in an illegal act, to say that his dereliction was merely 'technical.' Yet it was for the Mayor to judge whether the offense was sufficient to warrant dismissal. There is no denying that the facts which he cites, showing the good work of the department under Mr. Sturgis, are impressive. But while admitting all this, the Mayor's warning against future carelessness by any of his subordinates officials should be kept clearly in mind. Comptroller Grout's letters and the opinion given by the Corporation Counsel have called wide attention to the law as relating to public bidding for contracts. No further violations of this law, even though 'technical' in character, should be excused."

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"The Model City" at Chautauqua

THE United States is to be favored with a permanent model civic centre, planned and constructed along æsthetic lines, the donor of this municipal benefaction being the world-famous "mother Chautauqua," located on Chautauqua Lake, near Mayville, N. Y. The fact that this popular educational institution has undertaken this task is a sufficient guarantee that the project will be faithfully carried out, and that the information relating to civic betterment will be more widely diffused then if the movement were undertaken by any other institution.

After a broad and comprehensive plan had been marked out, drawings and designs in competition were received, and the award made to Mr. Albert Kelsey, of Philadelphia, who has associated with him Mr. Warren H. Manning, landscape architect, of Boston, and Mr. J. Massey Rhind, sculptor, of New York. The exhibition of the designs for the development and rebuilding of Chautauqua was held last month in the gallery of the Art Club, at Philadelphia, under the direction of the supervising architect, Mr. Kelsey. We hope to publish a full description of the plans in the near future.

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Instruction in Fire-Protection Engineering

THE Armour Institute of Technology, of Chicago, has announced a four-years' course in fire protection-engineering, leading to the degree of Bachelor of Science. This course will be inaugurated at the opening of the college year, September, 1903, under the direction of Prof. Fitzhugh Taylor, formerly engineer of the Underwriters' laboratories. The requirements for admission are identical with those for the mechanical, electrical, civil and chemical engineering courses. A special feature of the course will be a series of lectures by prominent insurance officials, architects, and contractors upon the practical features of their work. Through the courtesy of the Board of Directors of the Underwriters' laboratories, the technical laboratory work of this course will be given at the Underwriters' laboratories in Chicago.

Little attention has ever been given in this country to the prevention of fires; all the energy and skill have been devoted to methods of control and extinguishment. While we have been thus employed, England and several European countries have been giving more careful consideration to methods of prevention than to methods of extinguishment, and, as a consequence, they have succeeded in bringing about a greater annual reduction in fire loss than has been accomplished in America. For the last decade, sentiment favoring the foreign practice has been increasing, and the establishment of this course in fire-protection engineering is one of the results of this movement. It is decidedly a step in the right direction. The Armour Institute of Technology is to be congratulated upon being the first in the field, and the Directors of the Underwriters' laboratories are to be strongly commended for their action. This will not only create a demand for intelligent men trained in this special branch of engineering, but will provide the means for supplying such men.

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Convention Dates

JULY

The International Fire Prevention Congress will be held in London, England, from July 7th to 10th, in connection with the International Fire Exhibition.

The seventh annual meeting of the American Park and Outdoor Art Association will be held at Buffalo, N. Y., July 7th to 9th. Charles Mulford Robinson, secretary, 65 South Washington street, Rochester, N. Y.

The Nebraska State Firemen's Association will meet at Norfolk, Neb., on July 21st to 23d. E. A. Miller, secretary, Kearney.

The annual convention of the Illinois State Firemen's Association will be held at Champaign, Ill., July 28th to 30th. Walter E. Price, secretary, Champaign.

AUGUST

The State Association of New Mexico Firemen will meet in convention at Santa Fé, N. M., on August 12th to 14th. A. M. Dettelbach, secretary, Santa Fé.

The New York State Firemen's Association meets at Gloversville, N. Y., on August 18th to 21st. Thomas Honohan, secretary, Frankfort.

The annual convention of the State Firemen's Association of Virginia will be held at Danville, Va., August 20th and 21st. G. G. Cummings, secretary, Portsmouth.

SEPTEMBER

The International Association of Fire Engineers will hold its next annual convention at Atlantic City, N. J., September 8th to 10th. Henry A. Hills, secretary, Wyoming, O.

The New Jersey State Firemen's Association meets at Atlantic City, N. J., September 9th. William Exall, secretary, 823 Broad street, Newark.

The National Firemen's Association will meet at Chicago, Ill., on September 28th and 29th. D. W. Gillen, secretary, 176 Monroe street, Chicago.

OCTOBER

The next meeting of the League of American Municipalities will be held at Baltimore, Md., October 7th to 9th. John McVickar, secretary, Des Moines, Iowa.

The State Firemen's Association of Pennsylvania holds its annual convention at Allentown, Pa., October 6th to 10th. W. W. Wunder, secretary, Reading.

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Personalities

—The death of City Treasurer George B. Penrose was announced at a recent meeting of the council of New Orleans, La.

—The salary of Mayor W. M. Drennen, of Birmingham, Ala., has been raised unanimously by the council from $2,400 to $3,600 a year.

—City Auditor Alexander M. Wagner, of Sandusky, O., has been elected clerk of the council by the unanimous vote of the members of that body.

—Mayor Jeffrey, of Columbus, O., has offered to forfeit his salary if by so doing he can save the city from debt. The general expense fund from which his and other salaries come will possibly be overdrawn and the Mayor wishes to avoid this.

—Resolutions were introduced into the council of Butte, Mont., impeaching Mayor Patrick Mullins, charging that the Mayor had appointed collectors to take fines from disorderly persons and so compounded a felony. The resolutions were referred to a committee on judiciary.

—Mr. Edwin C. Nicewaner, C. E., formerly assistant engineer in charge of bridge sub-structural construction of the Bureau of Construction, Department of Public Works, Pittsburg, Pa., has been appointed superintendent of the Bureau of Highways and Sewers in that department.

—The Supreme Court of Kansas has decided the election for mayor in Kansas City, Kan., and Thomas B. Gilbert has taken possession of the mayor's office despite the assertion of ex-Mayor Craddock that he would never give it up when the former made application for it immediately following the election.

—The Supreme Court of Vermont has decided that Mr. James E. Burke was elected mayor of Burlington, over Mr. Donley C. Hawley. A number of ballots were thrown out at the time of the election and this gave the victory to Hawley. The Court decided that the ballots were good and so Burke will be mayor. He is a blacksmith by trade.

—Much surprise was occasioned in Danville, Ill., not long since when Mayor John Beard appointed an entire crew of negro firemen in the fifth ward. Mayor Beard has always been a leading Democrat in Illinois. He was said to have been the first Democrat removed under the last Administration, but has been twice elected mayor of Danville, receiving a large colored vote.

—Hon. William B. Hayes, Mayor of Pittsburg, Pa., has been indicted by the grand jury charged with a misdemeanor. The offense consisted of discharging an old soldier from the employ of the city along with a number of others last March, and thereby violating a provision of the law that forbids the discharge of old soldiers for political reasons. The mayor was acting under the "ripper" act which became ineffective in April.

—Mayor Howell, of Atlanta, Ga., has asked the council to provide for the election of all but two of the city's ministerial officers by the council instead of by popular vote. The change would apply to the city marshall, city comptroller, tax collector and commissioner of public works. He thinks the members of the council are better judges of a man's fitness for office than the people, as they come in contact with the officials more than do the majority of the people.

—The Municipal Voters' League of Hamilton, O., has preferred charges against Mayor Charles S. Bosch, to Governor Nash. Experts were exployed by the League to examine the books in the Mayor's office reporting a shortage of over $500 and that there were 3,000 warrants unrecorded and marked "dismissed." Warrants were found that were originally marked "guilty," but which later were erased partially and "dismissed" substituted. The League asked the Governor to investigate and take some action to clear up the scandal.

— In his annual address to the Council, Mayor C. A. Born, of Sheboygan, Wis., the social-democrat mayor, declared himself unalterably opposed to the contract system of doing public work. He thinks the city should purchase its own material and hire its own laborers. He recommends that free text books be provided for the schools and all public utilities should be owned by the city. He suggests that the Board of Public Works be altered so as to contain two practical mechanics and two street commissioners. He recommends that the waterworks and electric light systems be carefully considered before any action was taken looking to their installation. He also recommended that all the main streets be macadamized and that the fire department be increased.

—The clerks in the towns and cities of Rhole Island have formed an association to be known as the "Association of Town Clerks of Rhode Island." The purpose of the organization is to promote more uniformity in keeping the records in the several cities and towns and also for the betterment of the general conditions of the offices. Mr. Edward Field, clerk of the municipal court in Providence, was the prime mover in furthering the project and was elected president. The other officers are: Vice-president, C. Fred Crawford, Central Falls; secretary, Thomas J. Pierce, of Wickford; treasurer, Edward C. Joyce, Providence; executive committee, Samuel H. Roberts, Pawtucket; William E. Smyth, of East Providence, and James T. Lockwood, of Warwick.

—Dr. Edward Martin, the director of the Department of Public Health and Charities of Philadelphia, Pa., is one of the few "strenuous" kind of city officials and, if his strength holds out and he is assisted by the rest of the administration, bids fair to make the "City of Brotherly Love" one of the most healthy municipalities in the United States. He has completed plans for the extermination of the rats, to which rodents are traced the spread of contagious diseases, those infecting the Municipal Hospital and House of Correction being especially doomed to destruction. His next work has been the tracing of the sources of pollution of the Schuylkill river. His campaign to purify the milk supply of the city is being pushed as is also the inspection of places selling fruit and vegetables. The prevention of spitting on the sidewalks will probably be his next object. Dr. Martin wants charitable organizations to assist in establishing milk stations where the poor can get proper milk for the children.

—At the April election at Amesville, O., when the votes were counted, F. W. Gibson and Alonzo Weed had received the same number. To settle the point as to who should rule over the municipality, lots were drawn and Weed won out. Weed was said to be the smallest mayor in the United States, being but four feet and one inch in height, but had been an extended traveler, having been in every country of Europe, Australia and South America. About a month after the election, Governor Nash, of Ohio, was asked to suspend Mayor Weed under the power given him by the new code. The charges asserted that Weed was not a resident of Amesville, but had "just floated" into the place as a tramp from California; that he had no other occupation than that of a "hobo"; that he was mentally incapable of performing the duties of the office; and that he was an habitual drunkard. The village clerk, village marshal, and several councilmen made the request, and the Governor immediately suspended Mayor Weed. It is said that at the time of the election but one name—that of Mr. Gibson—was printed on the ballot, but some of Mr. Weed's friends suggested for a joke that he be voted for, with the result that he received as many as those cast for Mr. Gibson. After a hearing before the Governor, the latter declined to remove Mayor Weed, as he had done nothing since election to warrant removal.

Collection of Garbage and Ashes in Somerville

THE annual report of the health department of Somerville, Mass., contains the rules and regulations for the collection of ashes and garbage of the city, and other city officials will be interested to learn the system in use in this Massachusetts city. The regulations are as follows:

"Ashes must be placed in suitable receptacles not larger than an ordinary flour barrel, and must be kept free from all refuse matter.

"House offal or garbage must be kept free from all the refuse matter and in suitable vessels.

"All other refuse, such as paper, rags, excelsior, straw, mattresses, old clothes, pasteboard boxes, carpets, etc., must be kept free from ashes and garbage, and placed in suitable packages or barrels to prevent being scattered in handling.

"All ashes and refuse matter must be placed on the outer edge of the sidewalk, on or before seven o'clock in the morning of the day on which the collection is to be made.

"Earth, gravel, bricks, mortar, stones, lime, plaster, cement, concrete, or refuse material from construction or repairs of buildings will not be removed by this department.

"The department will remove tree trimmings, vine cuttings, and yard cleanings during the spring and summer months.

"Employees of this department are not allowed to enter cellars, cellar-ways, bulkheads, or areas for the removal of ashes or offal."

RECOMMENDATIONS OF MANY MAYORS

Good Walks Save Money—Defects in Ohio's New Code—City Judged by Condition of Streets—Wood Paving Block Plant for Chicago

City Judged by Condition of Streets

"A CITY is largely judged by the condition of its streets." This statement occurs in the annual message of Mayor D. R. Anthony, Jr., to the Council of Leavenworth, Kansas, and he further stated that nothing impresses a stranger so much as well paved and well kept streets, and nothing contributes more to the comfort of the residents of the streets as such thoroughfares. Provided the streets are paved and curbed, Leavenworth can be made, in his opinion, the most attractive city in Kansas. He therefore recommended that street improvements be vigorously prosecuted where needed. He called attention to the deplorable condition of the dirt streets, especially those in the residence sections, and in order to repair them he recommended that a modern grader or road machine be purchased. Because the present street department is loaded down with expenses that rightfully belong to other departments, the Mayor urged that each department of the city government be charged with its own expenses so that every dollar paid to the street department shall go for work upon the streets. Regarding street cleaning, he recommended that a new street scraper be purchased to take the place of the old one now in use, and promised that a sincere effort will be made to keep the streets clean. The city ordinances should be revised and the number of street lights should be cut down, as the Mayor thinks too many are being erected.

The railroad company should be compelled to run its cars for the convenience of the people and should keep graded and paved, according to its franchises, the street between its tracks and twelve inches on either side.

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Paterson Recovering from Great Fire

THE great fire that devastated a large portion of Paterson, New Jersey, prevented much work being done in improving the city, all available funds being devoted to recovering from the damage wrought by the flames. Mayor Hinchcliffe urged that all departments carefully guard expenses, so that the city debt might not be increased too rapidly. It was increased $43,500 in the past year, and this was due, in great part, to the rebuilding of the city hall. Had it not been for this, the debt would have decreased rather than increased. The sinking fund has an amount of $264,277.31 to pay off bonds issued for permanent street improvements. Taxes netted the city $1,459,771.49, being an increase of over $224,000 over the previous year. The appointment of personal tax collectors was largely responsible for this increased return, as previously many personal taxes had escaped. No bonds were issued last year for street improvements, and the Mayor urged that a similar course be followed this year. The sum of $25,000 should be devoted to the repair and maintenance of macadam streets. He urged that the streets be cleaned by contract, as the collection of ashes and garbage in this way has proved very satisfactory.

Further improvements should be made in the fire-fighting forces of the city, in order that the present rates of insurance may be reduced. He urged that the Council co-operate with the Chief of the Department in maintaining the discipline, and that the men be given to understand that violation of the rules will be met with severe penalties.

The City Engineer's department was greatly embarrassed on account of the fire, because all the records were destroyed, as they had not been placed in fire-proof vaults, and a great part of the year has been devoted to collecting the data for new maps and surveys.

The Mayor criticised the Police Department because of the existence of numerous poolrooms in the city which are unmolested by the police. He placed the responsibility on the head of the department, and the Board should see that he discharges his duty.

He commended the departments of Health and of Public Parks as having left nothing undone to promote the health and happiness of the people.

He said the lights should be better distributed over the city, as there are a sufficient number of lamps to properly light the territory, but their distribution is such that many sections are not properly illuminated.

He recommended that the trolley company be compelled to sprinkle the streets on which their cars run. The present financial condition of the city, in view of the loss from fire, is bright and encouraging, according to the Mayor, but no unnecessary expenditure should be indulged in.

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Municipal Wood Paving Block Plant

MAYOR HARRISON, of Chicago, presented his annual message to the City Council, in which is an exhaustive treatise on the traction question. He mapped out what he thinks would be the best course for the city to take in the franchise campaign. He insisted upon an absolute waiver of the ninety-nine year claims before any franchise extension ordinance should be voted upon. He recommended that creosoted wood block paving be laid and that a municipal creosoting plant be installed at the Bridewell. He also spoke of subways and the compensation for the use of the same. He discussed at length the question of arbitration as the only justifiable means of settling labor disputes. Among other things, he declared that ownership of the street railways is not socialism. He commended the signing of the Mueller bill to permit Chicago to own its own railways, and urged that the schools be removed from all political influence. In discussing labor conditions, Mayor Harrison showed that he is strongly on the side of the labor agitator, as he commended the use of the strike, although he declared that the strike is an industrial war, and lays the blame for all disorder on "a few radicals on both the side of the capitalist and that of the laborer."

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St. Joseph Needs Sewers and Improved Streets

THE message that Mayor Borden submitted to the Council of St. Joseph, Mo., was a long but interesting one. He called attention to the fact that the Council would still have control of matters which the new Board of Public Works was to initiate. For the second time he spoke of the inadequate revenue which still exists, and urged that steps be taken to secure more money for city purposes. More money will be secured this year according to the city assessors, but the city needs all the money that can be rightfully raised to carry out the many necessary improvements. One of the most important improvements is the extension of the main sewer system. The sewers must be laid before the many street improvements needed can be carried out. He thought it better to issue bonds to the constitutional limit of the city debt, and thus secure a sum large enough to build the sewers at once rather than wait and depend upon the dribbling sums that can be used from the general fund for this purpose. The bonded debt of the city amounts to $1,089,850, more than half of which is now due. The sinking fund contains $121,000, which can be used for liquidating a portion of the debt, but the rest must be paid from the sales of the funding bonds that will bear a reduced rate of interest. The general administration fund is in a good condition, and a large surplus is available over the expenses of the city for the coming year.

The last legislature passed a law prohibiting the city from grading streets in such a way as to cause damage for which the city could be held liable. Thus the grading of streets will rest with the property owners. He urged that the dirt streets be put in good condition, and that these and the macadamized streets be repaired systematically. The condition of the brick streets is fair and so much better than that of the asphalt that the terrible condition of the latter is emphasized. A way should be found to repair or reconstruct the worn out asphalt streets. "The sanitary necessity, the beauty and pleasure of clean streets need only to be mentioned: the way of securing them is the problem." He said that the paved streets should be cleaned and

washed thoroughly and continuously, and hoped that the Board of Public Works would be given funds for this purpose.

The streets in bad condition certainly need more light than those that are more perfect, and a means is presented of making the streets of St. Joseph more safe as well as more convenient. This exists in the increase and extension of the street lighting plant. A sum should be set aside from the bond issue to put the lighting plant in good condition. This would allow an increase in the number of lamps and would also reduce the operating expenses at least $15 per year per lamp. After making the streets fit for travel and adequately lighting them, a good system of street signs should then be taken up. Nothing has been done during the past year in this respect. Other points mentioned in the message related to adequate fire protection, the public libraries, the work of the health department which should be assisted by the police force, and a general revision of the general ordinances of the city. The Mayor made a good suggestion when he stated that there should be appended to the annual reports all general ordinances passed and approved during the year and all ordinances granting franchises or amendments thereto.

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New Ohio Code Defective

In his message to the Council after the adoption of the new code of Ohio, Mayor Tom L. Johnson, of Cleveland, bemoaned the fact this his city had been deprived of its good charter and would be compelled to work under the present code, which, in his opinion, is very defective. The city of Cleveland is now not only the largest in Ohio, but has successfully taken the lead in working out world-wide problems of municipal home rule. As the Federal government has taken over many of the functions formerly performed by the States, but has left the cities home rule in all matters strictly belonging to them, so the State should grant municipalities absolute home rule in all matters of strictly municipal concern. Previous to the new code Cleveland was familiar with the code of the Federal plan, and had developed "a civic conscientiousness and conscience among her people of a higher order than any other large city in the country," but the new code has destroyed this, and it will be necessary for the officials to do the best they can until Cleveland obtains more freedom.

He said that the officials must protect the people against interests that were grounded in special privileges which were served in greater or less degree by unfair apportionment of taxation. He said complete success in this direction would not be secured until the State Legislature establishes fair rules for the taxation of steam railroads and the like, and allows the cities to adopt systems of local assessment that admit of fairness in local taxation. He claimed that the legislatures were under the domination of corporations, and so unjust taxation must prevail, but the Cleveland officials should endeavor to arouse the people of the State.

Cleveland should avail itself at once of the right to manufacture gas and electricity for lighting purposes, and the management of these plants should be placed under the merit system, such as was introduced in the water department. The perfection of the merit system would be a great advance in the art of municipal government, for it would do away with the spoils system. Mayor Tom considers that the practice of granting private corporations franchises to do public business for profit should be abolished. He thought the city should own and operate, under merit rules, its own street car system, but until that power was given it by the State it should begin anew the work of establishing a system of low fares. He strongly criticised the Supreme Court for deciding against his friends on this question of three-cent fares, but was hopeful that better results would be obtained on the new agitation that is to be commenced.

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Bridgeport's Mayor Reports

The message of Mayor Mulvihill, of Bridgeport, Conn., was awaited with interest because of the Mayor's known sympathy with the street railway men then on strike in the city, but His Honor made little reference to the subject. He criticised the company for refusing to pay its share of the paving on a certain bridge over which its tracks were laid and urged that, while technically the company might not be compelled to pay because it was not allowed to make its own contract, it should be forced to live up to its franchise and pay for the cleaning of the pavement between its tracks and for two feet outside of the same. Although $56,000 worth of improvement bonds were sold, the total net debt of the city was reduced $14,222.09, being $1,510,767.80 on April 1.

The Mayor recommended that a chemical engine be purchased for the center of the city. The Gamewell police telegraph system was installed during the year and will aid in the work of the department. The city quarry has been given up as useless and the use of another quarry has been obtained. Over 8,800 square yards of brick were laid during the year and 24,730 square yards of new macadam placed on streets where the pavement had worn out.

The Mayor touched upon the city hall matter and promises to bring it up later. He stated that the tax rate would be higher on account of necessary improvements, but concluded that the reasonable citizen is not so much concerned with a slight rise in the tax rate as with the honest and economical administration of the public revenues. He said that no one would cast suspicion upon his honesty or charge him with encouraging extravagance.

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Good Walks Save Money

One of the greatest achievements in the direction of the health of Grand Rapids, Mich., has been the provision for a large trunk sewer on the west side of the city. In his message, Mayor Palmer considered that this work would greatly reduce the mortality of Grand Rapids. The municipal lighting department has a remarkable record to its credit. The $2,500 appropriated yearly to extend the system has been expected to take care of twenty-five lamps. The year just closed has seen fifty-four new lamps installed and seventeen more are now ready. The extensive laying of good sidewalks is decreasing the liability of injury to citizens and preventing numerous suits against the city. The committee on the sale of franchises has had little to do, because those who desire valuable rights have not yet come to a point where the question of consideration can be advantageously discussed. Better results would have been obtained by the committee on the abatement of dust and smoke had not the Board of Public Works disagreed with the Council as to who should pay for the stoker at the pumping station.

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Benefits of Municipal Trading

During the week ending February 21, 1903, the Bradford (England) Corporation issued a "Blue Book" dealing with the financial year ending March 31, 1902. The following figures are interesting, especially in view of the strenuous opposition that is being made to Municipal Trading by many interested persons throughout the country.

	Income.	Expenditure excluding interest and sinking fund.	Profit.	Rate per cent. on capital.	Capital invested.	Profit capitalized on a 3½ per cent. basis.
Water	$779,375	$156,171	$623,204	5.236	$11.914,557	$17,805,835
Gas	1,188,762	988,892	199,869	5.101	3,917,656	5,710,562
Electricity	257,184	146,484	110,699	5.873	1,884,748	3,162,855
Markets	124,123	83,452	45,670	3.790	1,205,110	1,304,882
Street Railways	341,942	284,683	57,358	4.160	1,377,625	1,638,823
Cemeteries ...	22,898	17,064	5,834	1.572	371,171	166,695
Conditioning House	29,668	22,197	7,470	8.406	88,872	213,442
Totals	$2,748,954	$1,698,845	$1,050,108	5.058	$20,759,743	$30,003,096

The Conditioning House is an establishment for testing wools, yarns, and all textile products. The capital invested in waterworks is exclusive of capital upon new works not yet completed and also of the sinking fund, upon which Parliament has suspended until 1904. Water, gas, electricity and tramway fares are all substantially below the charges made by private companies. Since 1902 the Corporation has acquired all the street railway lines, and the receipts therefrom will amount to $730,500 a year.

The above figures show a profit of $1,050,108.36, which represents a return of 5 per cent. on the capital invested; and it has been pointed out that the productive departments of the corporation floated as a public company on a 3½ per cent. basis of interest at the end of March last, when the tramway system was comparatively incomplete, would yield a capital of $30,003,096—a sum which would pay off not only the liabilities on the productive undertakings, but practically the whole of the Corporation debt of $31,060,601.89.

AN EXAMPLE OF GOOD BRICK PAVING

How to Lay Brick to Secure Good Results—Good Material and Proper Laying Must Go Together

THE first brick pavement laid in the United States was at Charleston, W. Va., in 1870, where a private citizen at his own expense paved a portion of the principal street of the city. The brick was only a hard burned building brick, but the years it has been down have shown that it had considerable enduring qualities. Since that time many cities have laid brick pavements. The manufacturers have been studying the question carefully, and have been putting out a product that each claims to be the best paving material attainable. The engineers were slow to accept brick for paving purposes, as they found it hard to believe that any artificial product

BRICK PAVING ON AIRY STREET, NORRISTOWN, PA.

could be equal to that formed by nature, but those interested in the manufacture of brick were persistent, and finally the engineers have agreed that paving brick forms one of the best of paving materials.

For several reasons the largest amount of brick paving is in the Central and Western States, but the Eastern cities are not backward in this work. It is bound to be the principal paving material in the Central States, because the supply of natural stone is limited and is expensive, while the clays and shales suitable for brick making are in abundance. When the pavement is well laid and the brick of good quality, this kind of paving will be most durable. Even the first brick that was laid, having none of the fine qualities of those at present manufactured, show remarkable endurance. Brick laid on a street of Bloomington, Ill., in 1875, when taken up after nearly twenty years of service, showed but three-quarters of an inch of wear. If the laying be poorly done, however, the best of brick will fail. The two—good material and proper laying—go hand in hand in this class of paving, as in every other. The manufacturer is often helpless as regards the ultimate success of the pavement in which his brick is used, and is made to share the blame for failure of the paving, although the quality of his material may have been of the best.

The accompanying illustrations show sections of some brick streets in Norristown, Pa., that were not only built of good quality of brick, but were also properly laid, and the result has been that they are in fine condition, although they have been in use since 1897, a period of six years. Brick paving laid as this was laid and giving the service this has given invites the paving of other streets with this material and will prove the best of advertising for the contractor and the manufacturer. Despite the large amount of paving that has already been laid in cities, city engineers are still studying the question of the best pavement for different kinds of streets. Each engineer has his preference, some holding that brick, others that asphalt, is the best, but all are mainly dependent for their opinions on the amount of experience they have had with both paving materials. When each city has laid a sufficient amount of the different classes of paving and they have been down long enough to bring out all their defects and virtues, city officials will lose some of the prejudices they have formed against some and take a more intelligent view of the whole subject. It is natural that one should form prejudices in favor of, or against, different pavements, according as one has had experience with them. So when a pavement has been laid as were the brick pavements in Norristown—of good material and in a proper manner—it serves as an object lesson of which the manufacturer is justly proud, and which he never tires of bringing to the attention of other cities, for it shows what his material can do when not handicapped by poor construction methods.

The paving in question was laid in Norristown in 1897, under the condition and specifications given by Borough Engineer S. Cameron Corson, as follows:

"The sub-grade was thoroughly rolled with a twelve and one-half-ton steam roller, upon the surface of this was laid four inches of concrete, hand mixed and made parallel to the finished crown. The mixture of concrete was composed of one part of neat cement, eighty-pounds test, mixed with two parts of crushed rock sand and six parts of one and one-half-inch stone. Sand and cement were mixed dry and enough water added to make a mortar. The crushed stone was then wetted thoroughly and dumped into the mortar, turned over and raked twice, and then rammed until a free moisture was shown on the top.

"This concrete was allowed to set for seventy-two hours before the sand cushion of one inch was applied, and afterwards the sand bed was drawn to a proper crown by a templet board. The vitrified bricks were supplied from the works of the McAvoy Vitrified Brick Company, at Perkiomen Junction, Pa., which is about eight miles northwest of Norristown. After the bricks had been laid carefully, they were rolled with a horse roller weighing about five tons.

"The grout was composed of a neat cement of 140 pounds test mixed with two parts of bar sand, and this was flushed into the joints between the bricks. Any holes that were not completely filled upon first application were treated to a grout of neat cement.

"The cement of eighty test cost at the time 87½ cents per barrel of three bags per barrel. The brick cost 66 cents a square yard and

SHOWING SEWER INLET AT MARKET AND AIRY STREETS

the concrete was laid at a cost of about 45 cents per square yard. The cost of the entire pavement amounted to $1.515 on the average, although in 1897 cold weather caught us and caused a little more expense, which raised the price to $1.61 per square yard.

INTERSECTION OF AIRY AND DE KALB STREETS NORRISTOWN, PA.

"After the flushing was finished, the paving was allowed seventy-two hours more to dry out before any travel was allowed on it. The sewer inlet shown in one of the illustrations was laid in 1901 and is in first-class condition, although subjected to severe tests, as the wagons drop down into the depression as they round the corner. The wear on the bricks on the other portions of the pavement has been uniform, being less than one-eighth of an inch in depth and from one-quarter to three-eighths of an inch on each side of the joint, where it has been beveled off by travel.

"Norristown has a population of about 23,000, although it is officially designated a 'borough.' There are 8.16 miles of paved streets, of which 75,500 square yards are of red shale vitrified brick paving."

Scranton's Needed Park Improvement

THE city of Scranton, Pa., a one-generation community, has had many things to do and not always enough revenue to do them properly. In the rapidity of its growth Scranton has frequently been likened to a Western city, and the comparison is fair save that most Western cities are willing to take large risks on their future in the matter of bonding themselves for improvements, whereas the disposition in Scranton has been extremely conservative in this respect. Under a peculiar law the public schools of Scranton are controlled by a school board, which is completely independent of every other feature of the city government and has power to incur indebtedness without limit and is subject to no audit save its own. Yet, notwithstanding the demand of a growing population for new school buildings and the wise tendency in Scranton to build buildings that will last, the combined bonded indebtedness of the city and school governments, corresponding to the bonded indebtedness used in most comparative figures, is only one million dollars in round numbers on a total valuation of $70,000,000.

Some years ago Hon. William Connell, Scranton's foremost citizen, donated to the city twenty acres of charming landscape, to be known as Connell park, conditional upon the city expending never less than one thousand dollars a year for its maintenance. Connell park is located on the South Side of the city, a community almost by itself. The West Side, another community, formerly under a separate government and comprising a population of more than forty thousand, largely wage-earners, has no park or prospect of one. Providence, another portion of the city, formerly a borough by itself, has perhaps twenty thousand population and no park. On the Eastern border of the central city, really remote from the wage-earning population, but beautifully adapted by nature for park purposes, having in its center a charming cascade, created by the falling of Roaring Brook—a spring-fed mountain trout stream that in the rainy season approaches the dimensions of a river—over a ledge of rocks for a distance of thirty feet, lies the only large park that Scranton has yet arranged for—called Nay Aug Park, an Indian appellation.

Nay Aug Park was purchased nine years ago for sixteen thousand dollars and comprises seventy-six acres, covered by trees, laurel bushes, rhododendron, wild flowers and picturesque boulders, with the Roaring Brook forming an iridescent bisecting line. After its purchase the park lay in its unimproved state for several years, during which time there was not even a sidewalk leading to it, but when the Scranton Railway Company laid a trolley line to its Western approach, the germ of a sentiment for park improvement was implanted in the community. Three years ago a bond ordinance of thirty thousand dollars was passed, and landscape plans were secured from William Eldridge, of Philadelphia. These plans contemplate preserving the natural aspects of the park as far as possible, and simply building around and among them those conveniences and facilities for the entertainment of visitors which park frequenters nowadays expect and require. They contemplate a total expenditure of approximately one hundred thousand dollars.

The thirty thousand dollars provided in the bond ordinance was expended in pursuance of these plans, and served to improve and equip an area equal to about one-fifth of the park. Lawn spaces, walks, driveways, flower beds and shrubbery were arranged, a band stand for summer concerts was erected in the center of a mall, and shelter and toilet pavilions, together with massive retaining walls, were built. About this time a beautiful fountain was donated to the city and placed in this portion of the park. Another donation of value was a small lake, with fountain in the center, intended to be converted eventually into aquatic gardens, but now used as a skating pond in winter and an aquarium in summer.

At this stage of the proceedings the city's purse became empty, and in a rush of complexities growing out of a change in charters and also on account of the coal strike, park improvement, so auspiciously begun, came to a halt. Recently, however, the agitation for it has been renewed, and the councils are now considering whether to issue one hundred thousand dollars' worth of additional park bonds, sufficient to complete the work and trim up the edges at one time, or to continue the instalment plan of improvement, adding a touch here and there as financial exigencies permit.

One peculiarity of Nay Aug Park that is worthy of mention is the fact that it is perhaps the only park in the United States with a tollgate within its borders. A short distance from the entrance, along the one through driveway, a toll house stands, and an enterprising official exacts various sums in consideration of permitting drivers of vehicles to pass forward toward the bridge which spans Roaring Brook and onward over a beautiful boulevard which winds round a spur of Moosic Mountain. This came about through the boulevard company getting there first, with a charter from the State which gives it secure possession until the city comes to its terms, buys its rights within the park, including the bridge, which it built, and gently but firmly moves its tollgate man on beyond the park limits. The sum required to effect this release is estimated at seventeen thousand dollars, which will have to come out of a bond ordinance now or later.

The major improvements yet to be effected in Nay Aug Park, according to the Eldridge plans, include a generous artificial lake with sandy bathing beach; a swimming pool and bath house along the brook; sunken gardens; a "zoo"; an athletic field and multiplied playgrounds, and provision for picnic parties, which already frequent the park in great numbers, coming sometimes for sixty and seventy miles in special excursions. Those who support liberal park improvement at this time argue that when the people see and realize what proper park facilities mean to them in health and comfort, a sentiment will arise sufficient to sustain councils, and, if necessary, force them, in acquiring large additional park accommodations in other parts of the city and in eventually developing a comprehensive park system which will be worth millions to future generations.

How Pittsburg Will Dispose of Waste Paper

THERE is a new head to the Bureau of Highways and Sewers in Pittsburg, Pa., and the streets of the city are to be kept cleaner than ever before, as well as in better repair. Director of Public Works Bigelow has appointed Mr. E. G. Nicewaner, C. E., superintendent of the department, and already the latter has taken measures to keep the streets clean. One of the greatest sources of untidiness in the streets of any city is the waste paper that blows about and makes the streets unsightly. It blows off of the wagons that carry the refuse to the dumps, or is dropped upon the street by the careless pedestrian, who throws away his newspaper or some advertising dodger that has been handed him by boys or men distributing the same. To dispose of this waste, Mr. Nicewaner has adopted the plan of stationing salamanders along the wharves, in which it will be burned. A salamander is simply a large metal cage in which combustible stuff can be burned. Instead of carting the waste paper to the dumps, it will be burned in the salamanders. Business houses can send their waste paper to the salamanders and have it destroyed.

PORTABLE WIRE SALAMANDER USED IN PITTSBURG, PA.

The department has been using a number of small, portable wire salamanders attached to the hokey carts, as shown in the illustration. In regard to these, Mr. Nicewaner wrote: "From the satisfaction they are giving, I am inclined to believe that they will eventually solve the paper nuisance." When a cage full of paper is gathered by the hokey man, he retires to the nearest alley and ignites. In a few moments he gathers up the handful of ashes, dumps it in his can and then resumes his beat.

The highway department is encouraging householders to buy this salamander, "for," writes Mr. Nicewaner, "90 per cent. of the paper we now take care of is thrown into the highways surreptitiously and in violation of the law. It is our hope that, after the householder is educated into an obedience of the law through frequent prosecutions for violations thereof, we shall see much waste destroyed by the ones whose duty it is to destroy it and not subject this bureau to a burden that does not properly belong to it." There are a large number of ordinances prohibiting the obstruction of sidewalks and the littering of the streets, but, as is often the case, they have been allowed to remain dormant. Mr. Nicewaner is determined to enforce them as far as lies within his power. An ordinance is before the council providing for a staff of inspectors who shall report violations of these ordinances. A number of store keepers use the sidewalks for storage purposes. This will have to stop. Instructions have been sent among the foreign population through the leaders that if they litter the streets they will get into trouble.

Statistics of Arc Lighting in United States Cities and Towns

	Population, 1900.	No. lamps. Open.	No. lamps. Closed.	Watts at lamp terminals. Open.	Watts at lamp terminals. Closed.	Schedule.	Hours burn per year.	Cost coal per ton.	Contract price per lamp per year.
Marlboro	13,609	54	...	340	...	(4)	2,372	$4.45	$87.50
Middleboro	7,000	24	...	340	...	(2)	12-2,239 / 12-1,265	4.80	z
Milford	12,000	...	54	...	430	(3)	1,877	4.38	100.00
Millbury	5,000	35	...	340	...	(2)	1,645	4.57	70.00
Natick	9,500	...	18	...	430	(2)(4)	1,600	4.35	79.00
New Bedford	62,442	208	...	480	...	(2)	3,428	2.50	123.65
Newton	33,587	191	...	340	...	(1)	4,000	4.00	100.00
North Abington	10,000	...	44	...	...	(3)	1,650	4.25	70.00
North Adams	24,200	170	...	...	...	(1)	4,000	4.00	88.50
Orange	6,000	50	...	340	...	(2)(3)	1,635	W. P.	75.00
Palmer	7,000	107	...	340	...	(2)(3)	1,500	4.65	75.00
Pittsfield	21,766	85	...	340	...	(1)	3,024	4.50	95.00
Quincy	23,899	58	52	340	430	(2)	1,600	4.25	75.00
Randolph	7,000	22	...	480	...	(3)	1,825	4.00	70.00
Reading	4,088	132	...	340	...	(3)	1,634	4.25	z
Salem	35,956	...	300	...	430	(1)	3,858	3.50	100.00
Shelburne Falls	2,000	...	100	...	...	(2)	1,600	....	90.00
Spencer	7,500	...	75	...	340	(2)(4)	1,550	4.10	114.97
Springfield	62,059	...	804	...	340	(1)	3,937	4.45	75.00
Stoneham	6,284	...	26	...	430	(2)(3)	1,300	4.25	80.00
Stoughton	4,762	...	60	...	...	(2)(3)	1,635	4.50	50.00
Taunton	31,036	247	...	340	...	(2)	3,200	4.00	z
Uxbridge	700	...	77	...	430	(2)	1,920	4.40	70.00
Waltham	23,481	147	...	340	...	(4)	2,389	4.18	83.95
Ware	7,596	51	...	340	...	(2)	2,179	4.50	75.00
Webster	4,867	66	...	340	...	(3)	2,000	4.25	80.00
Weymouth	2,522	...	33	...	430	(2)(4)	1,600	4.15	70.00
Winchendon	2,903	27	1	340	...	(2)	2,008	W. P.	75.00
Winchester	6,150	...	35	...	430	(2)(3)	1,300	4.25	80.00
Woburn	14,254	...	74	...	430	(2)(3)	1,300	4.25	75.00
Worcester	118,421	700	...	480	...	(1)	3,900	4.50	32.00
MICHIGAN									
Adrian	9,654	...	106	...	430	(1)	4,000	2.40	78.00
Alma	2,047	22	3	340	...	(2)(3)	1,130	2.50	56.50
Alpena	11,802	44	...	480	...	(4)	2,240	W. P.	75.00
Ann Arbor	14,509	114	9	480	...	(1)(2)	2,123	2.20	65.00
Athens	583	...	6	...	...	(2)(3)	1,220	(5)	60.00
Bad Axe	1,241	6	...	480	...	(2)(3)	1,220	Wood	z
Battle Creek	18,563	58	...	480	...	(1)(3)	1,825 / 4,000	2.50	57.00 / 69.00
Bay City	27,628	260	4	480	...	.....	3,069	1.49	z
Belding	3,283	20	...	480	...	(2)	1,550	W. P.	50.00
Brighton	781	...	21	...	550	(2)(3)	1,220	2.00	30.00
Bronson	1,176	20	...	480	...	(2)	2,196	2.15	78.00
Buchanan	1,708	36	...	480	...	(2)	2,179	W. P.	50.00
Cadillac	5,997	26	...	340	...	(1)	4,000	Wood	65.00
Caro	2,006	20	...	480	...	(2)(3)	1,220	2.35	60.00
Carson City	906	15	...	480	...	(2)(3)	1,220	2.30	60.00
Cassopolis	1,330	2	23	...	430	(2)(3)	1,220	2.45	50.00
Charlevoix	2,079	25	...	480	...	(2)	2,179	2.70	60.00
Charlotte	4,092	44	1	480	...	(1)	4,000	2.65	84.00
Cheboygan	6,489	48	...	340	...	20(1)(2) / 28(2)(4)	2,179 / 1,550	W. P.	65.93
Coldwater	6,216	79	...	480	...	(2)(4)	1,550	2.71	60.00
Detroit	285,704	2,055 / ...	12 / 18	480 / ...	... / ...	(1) / (2)(3)	3,716 / 1,385	2.05 / ...	z 66.45
Dundee	1,118	30	...	340	...	(2)(3)	1,220	1.65	54.50
Durand	2,134	22	...	480	...	(2)(3)	1,800	2.50	z
Evart	1,360	...	16	...	550	(2)(3)	1,220	Wood	z 25.00
Flint	13,103	113	...	480	...	(2)(4)	1,550	2.25	65.00
Fowlerville	946	30	...	480	...	(2)	2,179	2.80	60.00
Gladstone	3,380	22	...	480	...	(2)	2,179	2.25	50.00
Gladwin	775	3	...	480	...	(2)	2,179	W. P.	50.00
Hastings	3,172	30	8	...	550	(4)	2,190	2.20	50.00
Holland	7,790	46	13	480	430	(2)	1,658	2.80	z
Holly	1,419	24	...	480	...	(2)	2,600	1.85	60.00
Houghton	3,359	52	...	480	...	(1)	3,650	3.50	90.00
Howard City	1,398	6	18	480	430	(2)(3)	1,220	3.50	60.00
Howell	2,518	43	...	480	...	(2)(3)	1,600	2.35	60.00
Hudson	2,403	60	...	340	...	(3)	1,550	2.15	54.00
Imlay	1,122	12	...	340	...	(2)(3)	1,200	2.30	40.00
Ionia	5,209	65	...	480	...	(2)(3)	1,220	2.65	75.00
Iron Mountain	9,242	84	...	340	...	(2)	2,179	3.60	90.00
Ironwood	9,705	58	...	480	...	(1)(2)	3,000	3.40	93.00
Ishpeming	13,255	84	...	480	...	(1)	4,000	3.50	75.00 / 108.00
Ithaca	2,020	30	...	340	...	(2)(3)	1,220	2.85	72.00
Jackson	25,180	250	...	480	...	(1)	3,950	2.05	67.50
Kalamazoo	24,404	203	100	480	480	(2)	2,947	...	z
Kalkaska	1,304	34	...	340	...	(2)	2,179	...	68.52
Lake Lindon	2,597	70	...	340	...	(1)	3,650	3.50	90.00
Lansing	16,485	144	...	480	...	(1)	4,000	2.50	75.00
Lapeer	3,297	26	...	340	...	(2)(3)	1,567	3.00	62.50
Leslie	1,114	48	1	480	...	(2)	2,179	2.50	66.66
Lowell	1,736	26	...	480	...	(2)	2,179	W. P.	z 50.00
Mancelona	1,226	...	7	...	550	(2)(3)	1,220	3.00	60.00
Manistee	14,260	106	...	480	...	(2)	2,240	2.25	70.00
Marquette	10,058	88	...	480	...	(1)	4,000	W. P.	75.00
Marshall	4,370	84	25	480	...	(2)	2,600	W. P.	z 30.00
Menominee	12,818	58	...	340	...	(2)	3,300	2.75	65.00
Monroe	5,043	...	85	...	480	(1)	4,000	2.00	z
Mt. Clemens	6,576	81	...	340	...	(1)(2)	2,400	2.15	58.12
Niles	4,287	78	...	480	...	(1)	4,000	W. P.	z
Northville	1,755	...	40	...	430	(2)(3)	1,200	2.45	50.00

(1) All night. (2) Moon scale. (3) Midnight. (4) After midnight up to 1 or 2 A. M. The difference in time may be judged from the column showing number of hours lamps burn. (5) Burn refuse from saw mill. z Municipal plant.

The data given in the above table were collected by the General Electric Company, Schenectady, N. Y.

(To be continued.)

NEWS AND PRACTICE AMONG THE CITIES

Meeting of Mayors' Associations—New Asphalt Requirements in Milwaukee—Dirty Streets Cause Disease—War on the Mosquito

New Asphalt Specifications in Milwaukee

THE fight to open the asphalt specifications in Milwaukee, Wis., has been about settled and the specifications have been altered so that rock as well as Trinidad asphalt can be used. The previous specifications have been further altered that the amount of bitumen in rock asphalt "shall not exceed the limits of 9½ to 12 per cent." It was claimed by the champions of the rock asphalt that more than 8 per cent. of bitumen would soften the pavement, and, as this amount of bitumen was in the asphalt when it came from the soil, there was no need of adding other materials to it. This would make the pavement costly. The specifications as approved by the council committee require two and one-half inches of rock asphalt, or two inches of artificial asphalt, with one inch of binder course.

Streets and Water Works of Geneva

THE improved streets of Geneva, N. Y., aggregate 9.59 miles in length and are being added to every year. Last year the sum of $48,806.60 was expended on street improvements, and for 1903 the authorities expect to use all of the $55,000 appropriation for street work. They have not decided upon the material. The brick streets that have been laid have been satisfactory, and the creosote wood block pavement on Lake street, laid in 1900, shows scarcely any wear at all after three years' usage.

The cost of street cleaning during 1902 amounted to $2,475.48. The rate per square yard for asphalt was 4 cents, for macadam 4 cents, and for brick three-fourths of a cent. Street sprinkling cost, under contract, $3,261.57.

The waterworks are run under municipal ownership and the source of supply is Seneca Lake and springs. The average daily consumption is 212,145 gallons. The per capita consumption is 20.4 gallons per day and the daily consumption per tap, 106 gallons.

Disease from Dirty Streets

A LARGE portion of the annual report of Health Officer Friedrich, of Cleveland, O., was devoted to the subject of the necessity of paved and sewered streets as a preventive of disease. He states that there are 234 miles of streets unsewered and 363 unpaved. Dirt streets are a constant source of epidemic diseases, the dust disseminating the disease germs rapidly. A more thorough system of street cleaning should be instituted in the opinion of the Health Officer. Common dumps and pools of water that are scattered about the city are dangerous. Flies and mosquitoes are bred in them and carry disease to the citizens. He lays much of the lung diseases in the city to the prevalence of smoke. Respecting a filtration plant for the water supply and the diversion of the sewage from the lake, he has little to say, although he remarks that, ultimately, they will be necessary. A history of the smallpox epidemic of 1902 is given in the report, and it tells how it was extirpated, crediting the Chamber of Commerce and school authorities for the compulsory vaccination. There were thirty cases of black smallpox, all of which proved fatal. Of the 1,218 other cases, 224 were fatal, giving a death rate from this disease of 17.51 per cent.

Company Cannot Compete with Municipal Waterworks

WHAT is claimed as a legal victory for the city of Rochester, N. Y., was the decision of the Appellate Division of the Supreme Court of the State prohibiting the Rochester & Lake Ontario Water Company from supplying water to any one within the limits of the city. The city had forcibly prevented the company from laying its mains through Rochester, and were enjoined by the company from further interference in the work, a permanent injunction being granted by the Supreme Court. The city appealed to the Appellate Division, which held that the city could not prevent the laying of mains through the city because of the right of the company to convey water to two villages lying beyond Rochester, but, on the other hand, the company has no right to sell a drop of water to any one within the city. It was the belief of the authorities that the company wished to get its mains through the city on the pretext of carrying water beyond, and then to supply citizens in Rochester, entering into competition with the municipal waterworks. The company had contracted with a railroad to supply it with water. It is believed by Corporation Counsel Sutherland that, if the company cannot sell water to the citizens of the city, it will not find it profitable to simply carry water to the villages mentioned, and it will not continue to build its expensive system.

Connecticut Mayors Meet

THE annual meeting of the Connecticut Mayors' Association was held in Bridgeport the 9th of last month, being the guests of ex-Mayor Thomas P. Taylor. The meeting was attended by nearly every mayor in the State, and many former mayors and other officials were present. A few addresses were made in an informal way, Mr. Taylor welcoming the guests. Hon. Samuel Bassett, of New Britain, who was a member of the special legislative committee appointed by the Mayors' Association to look after certain bills in the legislature, reported on what had been done. He endeavored to have a law repealed which prohibited the cities of the State from engaging in public ownership of public utilities. He also tried to have changed the law compelling cities to pay taxes at full value on property outside of their boundaries. He did not succeed. He was not supported by other mayors, and so his efforts were fruitless.

After the meeting, the mayors were driven about the city to inspect the various factories and industries, and were then dined at the Brooklawn Country Club. Covers were laid for sixty. The following officers were elected for the coming year: President, Homer S. Cummings, of Stamford; vice-president, Thomas P. Taylor, of Bridgeport; secretary and treasurer, J. Milton Coburn, of South Norwalk; executive committee, Hugh Stirling of Bridgeport; Samuel Bassett, of New Britain; and Wilson M. Dart, of New London.

Alabama Cities Want Home Rule

IN his annual address before the League of Alabama Municipalities, at its convention in Birmingham in May, President E. B. Joseph, Mayor of Montgomery, called the attention of the members to the new constitution of the State, which practically takes from the municipalities the right of local government. It places the government of every city or village in the hands of the Legislature, without reference to the special needs of any particular community. The constitution should be so amended that the Legislature could grant charters to the different cities or villages as the people of these places might desire. He said: "Theorize as we may, the fact remains that municipal government comes closer to the direct interest of the people in their respective communities in the protection of their life, health and property, than either the State or national government. This being the case, I believe that each municipal community should be given the right to govern itself as it sees proper under such regulations as the legislature may see fit to prescribe."

The proposed provision of the constitution that the Legislature shall not permit any person or corporation to pay any license or tax to the State, and so be relieved of any municipal tax, was not adopted by the Legislature, and President Joseph urges that the League members bring pressure to bear on the members of the Legislature to secure some such provision and so prevent corporations from securing special legislation that will place them beyond the taxing powers of the municipalities. He also called attention to the law passed by the Legislature, under which the municipalities

will not have power to assess or collect taxes on solvent credits. This will deprive the cities of considerable revenue, while the State and counties will reap the benefits.

The committee appointed to take action on the President's address reported in favor of the suggestions he made, and in addition urged that a general municipal bill be passed under which all unincorporated places in the State having no special charters shall be incorporated. Mayor Blackwood, of Gadsden, secretary of the League, spoke of having all municipal elections in the State held on the same day and of making the terms of all mayors four years.

At the conclusion of the sessions, the following officers of the League were elected for the coming year: President, W. M. Drennen, of Birmingham; vice-president, Charles Henderson, of Troy; secretary and treasurer, J. E. Blackwood, of Gadsden.

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Meeting of Sanitary Association

THE second annual convention of the South Carolina Sanitary Association was held at Columbia on May 28 to 30. A number of interesting and valuable papers were read by prominent physicians of the State and ideas on sanitation for the benefit of health officers presented by the different speakers. Dr. Robert Wilson, Jr., city bacteriologist of Charleston, contributed a paper entitled "Quarantine in the Light of Modern Knowledge" and one on "Transmission of Malaria." Other papers were: "Drinking Water and the Receptacles Containing Water for the Human Family," by Dr. W. J. Folk, quarantine officer of Georgetown; "The Best Method to Prevent the Spread of Tuberculosis," by Dr. James Evans, of Florence; "Small-pox, Vaccination and Disinfection," by E. L. Reardon, health officer of Sumter; "Relation of Bacteriology to Sanitation," by Dr. B. E. Baker, of Charleston; "Practical Management of Small-pox," by Dr. J. M. Green, of Charleston; and "The Hookworm Disease," by U. S. Assistant Surgeon General H. D. Geddings.

The object of the convention is to encourage and help the work of the various boards of health throughout the State. The convention is always practical and the papers are treated from that standpoint, so that others than physicians will not be confused by theoretical statements or mystified by medical terms. How to avoid and how to battle with disease that threatens the communities are what health officers wish to know, and this information is imparted by the speakers to the best of their ability and in accordance with their experience. The old officers of the association were re-elected as follows: Dr. J. M. Reardon, of Sumter, president; Dr. J. W. Folk, of Georgetown, vice-president, and Dr. J. Mercier Green, of Charleston, secretary.

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Mayors of Wisconsin and Texas Meet

THE seventh annual convention of the Wisconsin League of Municipalities was held at Oshkosh on June 11 and 12, and the papers presented proved to be very interesting. At the first session a paper was read by Mayor W. J. Wallrich, of Shawano, on "Business Management of Cities." Mayor Shawano urged that a uniform system of accounting be established in the cities of the State. Mayor A. W. Wright, of Merrill, led the discussion. In the evening the president, Mayor Burt Williams, of Ashland, delivered his annual address. "A New Era in Municipal Government" was the subject of an address by Assemblyman Ira D. Bradford, of Augusta, who maintained that there had been a great advance in recent years in the character of city government in Wisconsin. The duty of the league was to awaken sentiment in favor of improvements. The second day papers on water supply, street construction, sewage disposal and municipal lighting were presented.

The Texas Mayors' Association met in annual convention at Marlin on June 9, and were welcomed to the city by Hon. M. N. Bryden, and interesting sessions were held on that and the following day. The following officers were elected for the coming year: President, Dr. J. R. Keating, of Cleburne; first vice-president, W. L. Gardien, of Gonzales; second vice-president, Dr. Larkin, of Athens; treasurer, H. M. Bryden, of Marlin; secretary, R. M. Chapman, of Greenville.

Necessary Provisions in a Street Railway Franchise

THE granting of a franchise to a street railway company by the Council of South Bend, Ind., was vetoed by Mayor Edward J. Fogarty on the ground that the provisions of the franchise were not sufficiently clear to be free from taint of illegality. He voiced a truism when he said that "it is much easier to reserve rights than to retrieve them after they have once been granted." In vetoing the franchise, Mayor Fogarty suggested certain features that should be in all contracts and ordinances for the use of the streets for street railway purposes:

1. For the use of the streets the terms of any franchise should not exceed thirty years. The tendency of modern times is toward shorter franchises.

2. The city should receive compensation in money or in useful public improvements, such as the opening of streets, construction of bridges, etc. Unreasonable exaction should not be made, but compensation granted in relation to the value of the privileges.

3. The city should reserve the right to permit other interurban lines to enter the city to a central point over the tracks of the applying company, and to permit the cars of other city lines to pass over such tracks, all on terms to be agreed upon by the interested companies.

4. The city should also reserve the right to regulate the matter of transfers as the interest of the public may, from time to time, require, instead of a fixed charge for transfer embodied in the ordinance.

5. The owners of property abutting on paved streets should be reimbursed for such portion of the pavement occupied by the line. The company should pay a proportionate share of any new pavement laid on streets occupied by the lines.

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Extermination of the Mosquito

EVER since the spring of 1901 the Council of Baltimore, Md., has been urged to set aside the sum of at least $15,000 for the purpose of destroying mosquitoes. Councilman George S. Brown has introduced for the third time an ordinance to this effect and is hopeful that the sum mentioned will be appropriated from the 1904 levy. Nothing can be done, therefore, this year, but the work can be planned and as soon as the money is available the work can be started. For some reason or other a number of the old councilmen were vigorously opposed to the appropriation, but these are not now members of the council and the ordinance will probably be passed. Health Commissioner Bosley has urged that the money be allowed the health department and it seems that all level-headed men will support the movement to rid the city of the annoying and disease-spreading pests.

Cities are awakening to the fact that the mosquito is more than an annoyance and the experiments in Havana, Cuba, Winchester, Va., and towns in New Jersey have proved conclusively that malaria, yellow fever and often typhoid fever are spread by this insect. A number of cities have appropriated money for the purchase of oil to spread on neighboring ponds, lakes, etc., so that the young mosquito may not have the opportunity of coming to the surface of the water to breathe. Mosquitoes do not fly far from their breeding places and, if all standing water is carefully covered with oil, the pests will soon be exterminated. Hartford, Conn., Borough of Brooklyn, New York, and other places have started a miniature war against the 'skeeters and if all other cities and towns would do likewise, malaria could be made a thing of the past. Along the north shore of Long Island and on the estate of Mr. William C. Whitney, some of the meadows have been drained of the brackish water, and the results have proven that draining of marshy places and oiling of standing water that cannot be drained, will soon do away with the mosquito. At Winchester, mentioned above, a law has been enacted for the extermination of mosquitoes, and arrests have been made when citizens failed to keep oil on their rain barrels or pools of standing water. The sum of $50,000 was spent in one year in killing the mosquitoes about Havana, but more than 400 lives from yellow fever and at least 250 from malaria were saved as a result of this work.

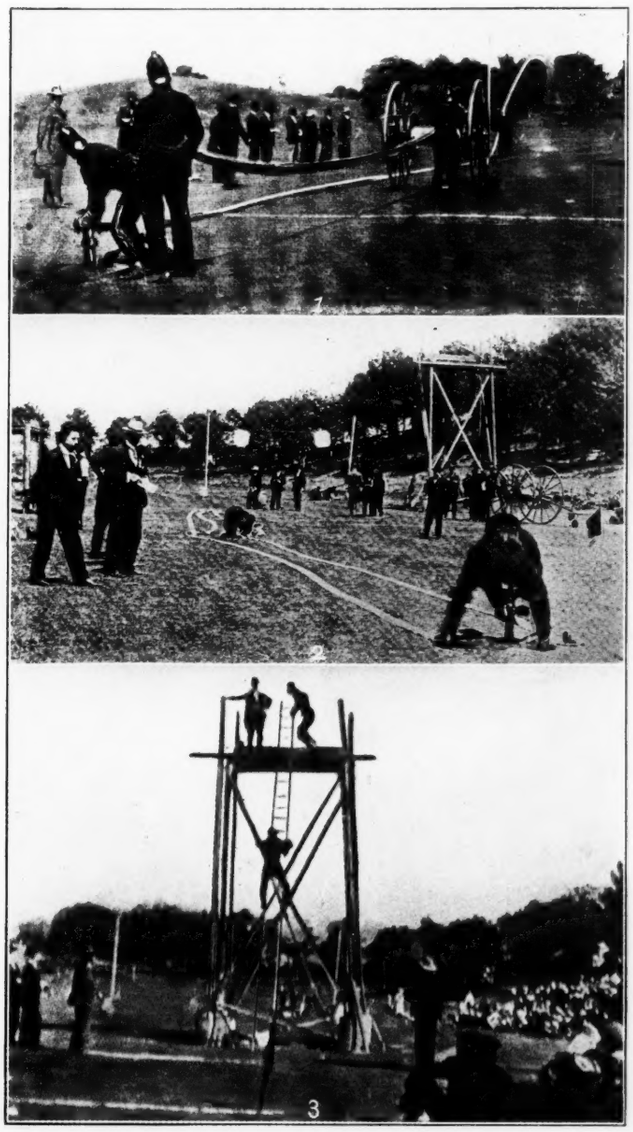
FIREMEN OF THE ANTIPODES

New Zealand Firemen at Play and Practice—Their Annual Competitions—More About the Fire Department of Auckland

By Our Special Correspondent

In the March issue The Municipal Journal, through its special correspondent, was able to give its readers some views of the new fire station in the city of Auckland, New Zealand, and to present some facts about the firemen of that enterprising city. In this article we hope to interest our readers by showing some views of New Zealand firemen at play, or as they appear in their annual competitions. The illustrations might suggest that the firemen were volunteers, inasmuch as the paid firemen of American cities seldom indulge in competitions such as our volunteers enjoy. These annual competitions serve the good purpose of not only exercising the men, but also of engendering an *esprit de corps* and a healthy rivalry that cannot but result in making the men better fire-fighters. Each department strives to send a winning team to the competitions.

The uniforms of the men are slightly different from that adopted by the firemen in America. The helmet is equipped with visors front and back to protect the face and neck. The equipment of the departments is not quite as up-to-date as is the rule in the United States, but every year sees additions, and, in Auckland at least, the department has not far to go to catch up with average equipped fire departments in America and England. The illustrations will show some of the equipment in use, such as the hose-reels and two-wheeled ladders, or escapes, as they are known in England. As will be seen, these escapes are telescopic, and may be raised to a height of from fifty to sixty feet. The ladders are trussed, and can be raised to their full height without being braced against a building.



1. HOSE AND REEL COMPETITION. 2. COUPLING COMPETITION FOR TWO MEN. 3. LIFE-SAVING PRACTICE

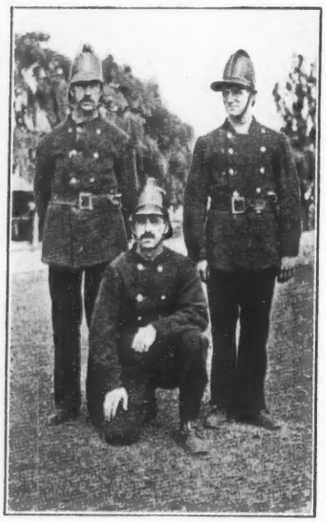
MANNING THE FIRE-ESCAPES

The fire brigade of Auckland was reorganized last year, and C. F. Wooley was placed in charge of the department. He had been second officer in the South Australian fire service, and was selected from a number of applicants as being the ablest man for command. The practice of going outside of the city for an officer, if a good one cannot be found at home, is a practice to be commended, and better city officials could be obtained if those who made the selection had the whole world from which to pick and choose. The former inspector, H. F. Gladding, was made second officer, and eight of the members of the old department were re-engaged at the time of reorganizing. Preceding Superintendent Gladding, John Hughes had been superintendent, and served the city in that capacity for a period of twenty-three years.

A number of improvements were introduced at this time. The new station described in the March issue was ordered built as a suitable headquarters, and the cost was placed at $25,175. A fire alarm system was constructed by the telegraph department and cost $5,872. All the fire stations were connected by 'phone, and lines were run to the police stations and central telephone office. The new station was the fifth in the department, although the others were smaller and not by any means so complete.

Previous to 1902 the horses were not owned by the department, but all this was changed, and now each station has its full quota of horses as required by the character of the apparatus and also some in reserve. Attempts were made at this time to throw the cost of maintaining the brigade on the consolidated revenue, on the local authorities and on the insurance companies, and Parliament was petitioned to that effect, but no decision has yet been reached. Until these different sources of revenue can be secured for maintenance, the city will have to provide for the department out of its tax levies. The expenses in 1902 exceeded those for 1901 by $8,953, but this extra expense was due to the purchase of new equipment and the charges incidental to the reorganization.

Considerable improvement has been made in the department in the last ten years, as will be seen from a comparison of the equipment. In 1891 the brigade consisted of thirty-nine men, including the superintendent, four stations, one six-inch hand engine, five hand hose-reels, one horse-reel, two ladder trucks and ladders, one set of scaling ladders, a set of pompier ladders, one canvas chute, two canvas jumping sheets, two hand pumps, 2,400 feet of leather and 1,750 feet of canvas hose, and nine bells. The expenses for the department for the year amounted to $3,707. The department has now the same number of men, but has the large, finely appointed central station previously described, an eighty-foot telescopic ladder sent out from England, 1,000 feet of rubber-lined canvas hose imported from Canada, a telescopic ladder recently forwarded by a London firm, and a 460-gallon steam fire engine. A fire-boat has also been put in service for harbor duty. A salvage department has been organized and the fire alarm telegraph system installed throughout the city. A good water pressure aids materially in the work of keeping down the losses from fire, and the city may congratulate itself on having such good protection. The surrounding towns have also received good assistance from the Auckland fire laddies, although they are not required to render such assistance. The number of serious fires has been decreasing gradually, and this is not only due to better building regulations, but also to the efficiency of the fire-brigade. There are less alarms of fire than in the past years. In 1883 the number of alarms totaled 120, in 1885 there were 146, but these figures had dropped to 49 in 1891, rose to 67 in 1894 and have averaged about 60 ever since. In 1899 there were twenty-five serious fires, while last year there were but two.



SHOWING UNIFORM OF NEW ZEALAND FIREMEN

TESTING ACCURACY OF PIPE PLAY—STRIKING THE DISCS

The life of the Auckland fireman is not a hard one, judging from the many advantages he enjoys and the many comforts that have been provided for him in the stations. Sixty alarms a year mean but few runs, and the small number of serious fires offers but little opportunity for injury in the discharge of his duties. Whenever accident or sickness does result from his work, he is taken care of by the "Sick and Accident Fund," which pays the sum of $7.50 a week as long as he is incapacitated for duty.

MAKING A TEST OF AUCKLAND'S FIRE-BOAT

A Fire Nozzle that Needs No Holding

ONE of the most important factors in the supplying of streams for fire-fighting purposes is the amount of friction in hose and nozzle that rapidly cuts down the water pressure from the time it leaves the engine to its discharge from the nozzle's mouth. A large share of this pressure is lost in the nozzle itself, and any invention that can reduce this will be of the greatest service to fire departments. Tests of the Glazier Universal Nozzle on the fire-boat "New Yorker" developed the remarkable fact that the loss in pressure between the inlet and outlet of the nozzle ranged from zero to five pounds. The results were obtained from using engine pressure gauges attached at the inlet and outlet, and the pressures varied as follows:

Inlet.	Outlet.	Inlet.	Outlet.
45	45	150	145
60	60	170	165
75	72½	180	175
100	95		

Another one of the many advantages ascribed to this nozzle is the fact that there is no need of firemen holding it. Many of the complaints coming from fire departments are that not enough men are assigned to companies to do the work, inasmuch as it is claimed that four or five men are needed to hold a large nozzle when three or four streams are siamesed into it. With the Glazier nozzle, one man can attend to it, or it can be left to look after itself. This will allow men, usually assigned to hold the pipe, to be utilized for other purposes. The Glazier nozzle is not held by jacks, holders or appliances of any kind, and will remain "where it is put" without attendance while under pressure. It will not leak or lock.

TEST OF GLAZIER NOZZLE BY INDIANAPOLIS FIRE DEPARTMENT

One of the illustrations shows the Glazier nozzle for use on hose wagons. It has a three-way connection. It would seem that there would be too much strain on the support to hold the nozzle in position, but when the nozzle was tried in the same position on the fire-boat "New Yorker" the machine was bolted to the plank on which it rested, and the latter was fastened to the stringers with but seven tenpenny nails. There was no recoil or back lash.

The other illustration shows the kind of nozzle for hose lines on the street—the single arm or stand-pipe nozzle. These single arms are used in factories for inside or outside purposes. The nozzle can be attached to the water pipe running along the ceiling and dropped to any position, so as to direct the stream on the fire. A number of cities have adopted the Glazier nozzle in their fire departments, among the number being East St. Louis, Ill., Pawtucket, R. I., and Minneapolis, Minn.

A request to the Glazier Universal Nozzle Company, Indianapolis, Ind., will bring a pamphlet that will tell all about the uses to which the nozzle can be put and show illustrations of how it is used.

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Salaries of Police and Firemen in Youngstown

ORDINANCES have been passed by the Council of Youngstown, O., fixing the salaries of the members of the fire and police departments. In the fire department the following salaries and bonds will be in force: Chief, salary $1,500, bond $1,000; six captains to receive $1,080 salary, bonds $500; twenty-eight firemen, salaries $900 per year, bonds $200; assistant chief, salary $1,200, bond $500; three cadets at $780, bonds $200; an electrician at $480, bond $100; a lineman at $390, bond $100.

The salaries and bonds in the police department are to be as follows: Chief at a salary of $1,500, bond $5,000; lieutenant at $1,080, bond $500; one city detective at $1,200, bond $500; fifty patrolmen at $900, bonds $500; ten cadets at $780, bonds $500; one electrician and one lineman, the same as in the fire department; and a janitor at $660, bond $100.

In Canton the salaries to be paid to the police department members have been decided upon by the council and are as follows: Chief, $1,000; captain, $845; lieutenant, $845; sergeant, $845; two patrol operators, $845 each; two patrol drivers, $845 each; two turnkeys, $845 each; fifteen patrolmen, $845 each. Each officer and member of the department must file a bond in the sum of $500. All members are to be appointed by the board of public safety.

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Improvements Recommended for Dallas

A LARGE number of recommendations was made in the report of Chief H. F. Magee, of the Dallas, Tex., fire department. He asks that all the alarm boxes in the business sections of the city be equipped with keyless doors, as it is difficult to obtain a key after 6:30 p. m., when all the houses are closed. A fire alarm office should be installed where three men could be employed to transmit alarms, as the city electrician cannot attend to these and also inspect for the different electric companies. The engine houses should be remodeled and the wooden floors done away with. Cisterns should be placed in the downtown sections and gate valves opening into them placed on the water mains. An engine company should be placed in Northeast Dallas, as the nearest engine has to travel a mile and a quarter to reach this section. Another engine company should be placed in the thickly settled sections. An eighty-five foot aerial truck should be purchased to replace the old one, which is not long enough to reach the tall buildings. All fire hydrants should be made three-way and have not less than six-inch inlets. All the four-inch mains should be replaced with six-inch ones. The buildings in the city should be inspected by a man especially assigned for that purpose, and the department should be notified of all obstructions in the street as often delays occur in going to fires, because the department meets with unexpected obstructions.

During the year 301 alarms of fire were received, or fifty-three less than during the previous year. More than one-half the alarms were by telephone. The steamers put out fifty-three fires and the chemical engines twenty-five. Confined to the buildings where the fire originated were 227; extending to adjoining buildings, 21; and spreading beyond them were 7 fires.

WHAT POLICE AND FIREMEN ARE DOING

Strike of a Police Force—Better Fire Protection Needed in Columbus—Improvements for Several Fire Departments—Police to Keep City Clean

Firemen Will Be Given Better Training

HEREAFTER the firemen of Springfield, O., will be required to be up-to-date and familiar with all buildings of any importance in the city. The board of public safety has ordered that the chief plan so that the men shall be taken around and make a systematic study of the buildings from a point of view of fighting fires within them. After a sufficient length of time has elapsed, the men are to be examined as to their knowledge on the subject, and failure to answer the questions will be deemed good grounds for dismissal. The board will also introduce more drills in the department. The force will be called out often, and a close watch kept upon its movements to see where improvements can be made.

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Changes in Cleveland's Police Force

A CONSIDERABLE "shake-up" has been ordered for the fire and police departments of Cleveland, O. Mayor Tom L. Johnson and Chief Wallace, of the fire department, have been figuring how they could get rid of some of the members of both forces who are are not capable of good work, but have not yet reached the age limit at which they can be retired on pensions. According to the law, a man can be pensioned after serving twenty-five years. Several of the police officers that have passed the twenty-five year mark are still good officers and should not be removed, while others who lack a year or two of the age limit are incapable of good work. The hard problem presented is what to do with these men.

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City Electrician a Benefit

GREAT benefit has been derived from the appointment of a city electrician in San Antonio, Tex., for protection has been accorded the general public from fire and faulty electrical construction. Much of the work of City Electrician White has been the inspection of electric fan wiring. The fans are idle all winter and must be inspected before they are put in operation in the summer that there may be no possibility of danger when the power is turned on again. Few fires arose during the past year from defective wiring, although there is some very old wiring in the central portion of the city that should be changed before trouble arises from it.

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Police to Keep City Clean

THE efforts of the city officials of New Orleans, La., to keep the city clean are not meeting with the success hoped for by them, and the police and public works departments are not in a condition, financially, to look after the enforcement of the ordinances as strictly as they should be enforced. Mayor Capdevielle and Police Chief Journee have conferred about the matter, and the latter has issued anew strict orders to the police officers to arrest the offenders against the laws of sanitation and cleanliness. A few examples are all that are required to bring home to the others the necessity of obeying the ordinances. People persistently violate the garbage laws, allowing garbage to stand on the sidewalks from day to day, others litter the gutters, walks and streets. Chief Journee expects to hold each officer responsible for violations of these sanitary laws on his beat. The Mayor asks the people to assist the administration in keeping the streets clean. Many of those loudest in complaints against the filthy gutters, etc., contributed a large share towards their accumulation of refuse.

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Fire Insurance Companies Should Examine Risks

THE use of glass lamps should be prohibited, according to Fire Marshall Shaw, of Massachusetts. He said that a certain kind of match had been prohibited by law, but the use of glass lamps for burning kerosene are much more dangerous. He recommends that a law be passed to prevent their use. The metal lamps are but a little more expensive, and there is no danger of their breaking if knocked over. He also called attention to the way insurance is placed in the State, and considered that it is responsible for many incendiary fires. He referred to the local agents, who wrote insurance in their offices without having seen the property. The consequence is an over-insurance and the inducement to defraud the companies. As no life insurance would accept a person until he had been examined by a competent physician, so the fire insurance companies should not take risks or be allowed to do so without investigation, because of the danger to surrounding property from incendiary fires.

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Insubordination in Bridgeport Fire Force

THE recent strike of the trolley employees in Bridgeport, Conn., caused the police department considerable trouble, and it was necessary at one time to call on the fire department for assistance in quelling the mob. Mayor Mulvihill had given Chief Coffin, of the fire department, instructions to get out an engine and turn the water on the mob at the car barns, but it was found that not enough regular men could be obtained to take care of the apparatus and horses, and so it was decided to rely upon some of the call men. One of the first men found was Hoseman Madden, who absolutely refused to report for duty or to turn water on the mob, as he considered he had enough "pull" with the Mayor and commissioners to defy the Chief's orders. Madden was suspended at once by Chief Coffin and charged with insubordination. One of the commissioners desired to have him sufficiently punished to secure future order and discipline in the department, but the Mayor and other commissioners considered that Madden had been punished enough by his suspension, and it was finally decided to reinstate him with a reprimand and a fine of $5.95, the pay for the time he was suspended.

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Troy Should Improve Its Fire Department

THE inspector general of fire departments has reported on the fire department of Troy, N. Y., to the local agents of the insurance companies there, and states that there is an urgent necessity for an early abandonment of the present volunteer department and the establishment of a full paid force in its stead. The inspector general goes on to outline the force that should be placed at each of the fire stations, viz.: a captain, engineer and stoker for steamer, two drivers and from six to eight hosemen; for the hose companies, one captain, a driver, and six hosemen; for the truck companies, one captain, one driver, one tillerman, and six laddermen. Permanently employed horses at all the stations are needed. Fire stations should be erected for three companies, which should be full paid and be equipped with the best apparatus. A new steamer should be placed in the manufacturing district, and a combination chemical engine and hose wagon should be installed in place of a hose reel in one company. An aerial truck and water tower apparatus should be obtained for station No. 3. A new company should be located in a station on Canal avenue and Third street, the reserve truck in station No. 2 should be placed in commission, and the 2,000 feet of inferior hose should be replaced with a similar amount of first-class material. Uniform couplings should be placed on all hose. Additional circuits should be placed on the fire alarm system connecting Troy and the North End, or Lansingburg district.

Laws governing the construction and the inspection of all buildings should be enacted, including the provision of battlement walls to extend above the roofs and non-combustible roofing. Modern combination chemical hose wagons should replace the present hose wagons in the mercantile districts. A duplicate water main should parallel the present main leading from the reservoir, so that the North End will have sufficient water supply.

Inspection of Rochester's Police and Firemen

THE annual inspection of the police and fire departments of Rochester, N. Y., was held on June 16, and the showing made by two forces gave the citizens cause for the pride they take in the men. The inspection was held on the campus of the University of Rochester, where the police force was put through a number of evolutions by the drill master. When this had ended, every fire station was notified by a stroke on the gong and each company left its quarters and formed in the procession. The Exempt Firemen's Association was in line for the first time in many years, and the members received their full share of applause. Mayor Rodenbeck, Commissioner of Public Safety George A. Gilman, and other officials reviewed the men and complimented Chief Cleary, of the Police, and Chief Little, of the Fire Department, on the appearance of their respective commands.

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Fire Improvements in Montreal

AFTER stating that a few improvements in the fire department of Montreal, Que., would induce the underwriters to lower the rates, Chief Benoit was ordered to make a complete report as to the improvements to be made. A new station in the West ward was recommended to add better protection to that congested district. In it should be placed two steamers, a water tower, a hook and ladder truck, salvage wagon, a Siamese wagon, two stove wagons and a chemical engine. In another station, after rebuilding, should be placed a hose wagon, a steamer, a hook and ladder truck and a hose reel. In another quarter a station should be built and equipped with a steamer, hose wagon and truck. The number of firemen should be increased by twenty-five.

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Strike of Erie Policemen

IN the latter part of May the entire police force of Erie, Pa., sent in resignations, to take effect on June 1, if the Council did not increase the pay of the patrolmen to $75 a month. The resignations stated that in March and April the authorities were petitioned for a raise in salary to $75 a month, but, without the consent of the policemen or consultation with them, the amount was cut to $70. The men complained that the clerks in the department had been raised upon request and the men wished similar treatment. In answer to this ultimatum, the Mayor accepted the resignations of the officers as offered, and special police were immediately appointed to patrol the city until the new force could be gotten into shape. The Mayor issued a statement to the public, calling attention to the procedure previous to passing the ordinance fixing the patrolmen's salaries, showing that over three weeks elapsed between the proposition and final passage of the ordinance, and no word of protest was received from the officers. The two bodies of the council took no action on the ultimatum, and the officers met and drew up a resolution to the Mayor, asking him to return their resignations, as they considered that they had acted unwisely, but the Mayor concluded to accept the resignations and form a new police force. A large number of applications for positions on the force were received at once, more than twice the number of places vacant, a number of the old men asking for reinstatement.

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Columbus Needs Better Fire Protection

THE Ohio Inspection Bureau, which is supported by the fire insurance companies of the State, has made an inspection of the fire protection facilities in Columbus, and the conclusion drawn is that the police, fire and waterworks departments are in need of many improvements. The city has outgrown the waterworks system, which was installed for a much smaller city. Thirty more policemen should be on the force, according to the report. The arc lighting system has very poor insulation and the line poles are greatly overloaded, and the insulation of inside wires far from standard. Circuits have been too heavily loaded. Better supervision should be exercised by the municipality over the installation of wiring and the ordinances for prohibition of rubbish accumulation in alleys and those for the exclusion of frame buildings from fire limits have not been strictly enough enforced.

Among the recommendations made by the bureau are the following: A storage dam with a capacity for ninety days' supply, two standpipes of forty feet diameter, a number of new mains, replacing of all four and six-inch mains with eight-inch in the mercantile districts, and more hydrants in these sections; three fire cisterns should be placed in the northern and western sections and the water pressure increased. Four new engine houses for first-class steamer, hose-wagon and eight men should be built, and in one place, in addition, should be a truck and four men. Much of the apparatus should be repaired, and indicators and alarm boxes should be installed. A city electrical inspector should be appointed and suitable ordinances passed governing electrical construction.

In spite of these recommendations, the bureau concludes that Columbus is a good brick city, with fire protection better than the average. In speaking of the charges made by the bureau, Mayor Jeffrey said that, if the city had more money, it could introduce the improvements recommended by the bureau, but must do the best it can with the money at hand.

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Fire and Police Personals

—G. F. Breitenstein, superintendent of fire telegraph, of Utica, N. Y., died on June 2 of typhoid fever.

—Mayor Mullins, of Butte, Mont., has forced Chief of Police Reynolds to resign and appointed Thomas Mulholland to the position.

—Mayor Crolius, of Joliet, Ill., recently discharged Chief of Police Philip Reitz on the ground of incompetency and appointed Theodore Bitzen chief.

—The plans for the new engine house for Youngstown, O., which will be ready for service in September next, were drawn by Chief Loller, of the department.

—Chief Edwin Smith, of Newport, O., has been deposed by the board of police and fire commissioners, and Harry H. Deputy, an attorney, placed in the position.

—M. M. Gallagee has been appointed assistant chief of the fire department of Dunkirk, N. Y., to succeed Otto E. Walter, who resigned. Mr. Gallagee was formerly second assistant chief.

—James E. Burke, the recently declared mayor of Burlington, Vt., suspended from office Chief of Police Brownell, charging him with partisanship in the last election. He declared he would act as his own chief of police.

—San Jose, Cal., has a new police chief in the person of T. W. Carroll, who was recently appointed to the position by the board of police and fire commissioners to succeed Edward Haley, removed. The latter was appointed by the previous administration, but a failure to have his certificate of appointment properly filled in gave the board the opportunity to remove him.

—"The Live Oak Hose Company" was recently organized at Hammondton, N. J., the members being the officials of the town and business and professional men opposed to the fireman's tax exemption. The officers elected are: President, Mayor Michael K. Boyer; vice-presidents, Editor Thomas B. Delker, Thomas H. Coggy; secretary, Town Clerk J. L. O'Donnell; treasurer, Councilman Daniel M. Ballard; foreman, Otis Small; assistant foreman, Louis Langham; marshal, William H. Burgess.

—Chief Engineer Robert William Dutton, head of the fire department of the District of Columbia, was recently appointed deputy recorder of deeds and so tendered his resignation as head of the fire department. Chief Dutton was to have left the department in July, but his appointment hastened his departure. He recommended to the commissioners that his successor be Senior Assistant Chief William T. Belt, to whose earnest assistance he accords any success that has come to him and the department. Chief Belt has been a fireman since he was sixteen years of age, having been a member of a volunteer hose company. He has served in every position in the paid department, and was virtually the chief of it as far as the actual fire-fighting went. There existed the best of feeling between him and Chief Dutton. The commissioners have appointed Chief Belt, as recommended by Chief Dutton, and the District will now have at the head of its fire force a man who is a fireman through and through.

LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

Books

When an author attempts to review the conditions existing in American or other municipalities and to make definite statements concerning any special condition or conditions in any one city, it behooves him to inquire carefully into the facts before putting them in print. Several errors of fact have the effect of causing a reader to cast doubt upon all the other statements with which he is not familiar, and it is presumed that it is the function of such a book as *American Municipal Progress* to inform about the municipal conditions throughout the country. Unfortunately, however, the author, Professor Charles Zueblin, has made several misleading statements, although the greater portion of the book will be of interest and prove instructive. It is evident that the author has written more from knowledge obtained by reading and from the reports of others rather than from personal observation and experience. In great measure this, of course, would be unavoidable, but a more intimate knowledge of some municipal enterprises in general should be obtained before attempting to speak learnedly of them. Garbage and sewage disposal, for example, appear to be but hazy subjects in the author's mind.

We do not, however, wish to condemn the work as a whole, but desire to warn against accepting too freely details as facts. In giving a review of such an extensive subject as is represented here, it was manifestly impossible for the author to dwell at length upon any one subject, and the author may be pardoned for dismissing important points with a few well chosen phrases. His remarks on the public ownership and control of public utilities are all well put. He is right in stating that "the life of one generation is long enough to provide adequate remuneration for such investments (franchises)." He believes that where a private concern has developed organization to such a point that stability is assured, and the possession of unusual privileges secures a steady income to investors, "the time is ripe for public ownership."

In the introductory chapter the author discusses municipal sociology and outlines an ideal municipality. He then takes up the subjects of Transportation, Public Works, Sanitation, Public Libraries, Public Schools, Public Buildings, Parks and Boulevards, Public Recreation and Public Control, Ownership and Operation. A number of appendices follow the regular chapters. The first gives a comparison of the statistics of Boston and St. Louis. The second compares New York, Philadelphia, Boston and Chicago as to general municipal conditions. The third is devoted to track elevation in Chicago. The fifth contains the act providing for the organization of the Hyde Park school as a school city. Appendix VIII. is a summary of the laws relating to compulsory education and child labor in America. Appendix IX. is devoted to the sanitary conditions of the schools of Washington, and XI. contains the rules governing the public baths of Milwaukee. This book may be obtained through THE MUNICIPAL JOURNAL for the sum of $1.25 net.

An *Index of the Technical Press* is to be issued by The Association de la Presse Technique and is designed to cover all the technical journals of the world. The *Index* will contain the title of the article with a brief explanation showing the phase of the subject treated, the author's name, the origin, the date of publication and the length. The present series of indices will be printed in English, French and German. Articles from journals in these languages will appear in the three languages mentioned. Articles in Italian, Spanish and Russian journals will be indexed in French and those from Scandinavia and Holland in German. The *Index* will be printed on one side of the paper only and in a column three inches wide and eight long, so that engineers may be able to extract such portions as they desire and place them in scrap books under appropriate heads. The first *Index* appeared in April and others will follow monthly. The address of the publishers is 20, Rue de la Chancellerie, Brussels.

The Department of the Interior of the United States Government has issued a bulletin entitled *Contributions to Economic Geology, 1902*, the compilers being S. F. Emmons and C. W. Hayes, geologists in charge. This report contains sixty-one contributions from thirty-three members of the Geological Survey and a brief statement of the extent and character of the economic work being carried on in the Survey. While many subjects dealt with by the Survey are included in this report, two sections are of especial interest to municipal engineers. These are the sections on "Oil, Gas and Asphalt," and on "Cement." The former section includes the origin and distribution of asphalt and bituminous rock deposits in the United States, the petroleum fields in California and elsewhere and a list of publication on gas, oil and asphalt. The second section, on "Cements," contains a list of publications on this material as well as the investigations carried on in Arizona. The report is well indexed and can be had on application to the United States Geological Survey of the Department of the Interior at Washington, D. C.

The Floods of March, 1902, is the subject of a brochure by C. C. Vermuele, showing the effect of the proposed drainage works on the floods in the Passaic valley, New Jersey. It has been reprinted from the annual report of the New Jersey State Geologist for 1902, and describes the floods of February 28 and March 5 of last year. The following conclusions were drawn from the data collected from these and previous floods in this section: Recent years have not shown either increased height or frequency of freshets; forestation cannot prevent such freshets, inasmuch as they are due to ice and snow, and because forests increase the accumulation by shading the earth; topography and soil, degree of saturation of the soil, and the rate of precipitation are the principal factors in determining the rate of flood-discharge; the maximum rate of discharge and the volume of water run off are not necessarily related to each other on precipitous catchments, but on streams bordered by flats, they increase or decrease together; encroachments upon the waterway of streams, without regard to the flood marks, must result in loss of property and even of life.

The Board of Police Commissioners of New Orleans, La., issued a handsome souvenir in honor of the convention of the International Association of Police Chiefs that was held in their city in May. It is a book of some seventy-five pages, containing a large number of illustrations of interesting scenes about the city, such as views of the police stations and squads of policemen, park views, and portraits of all the members of the International Association. In the front are large portraits of Mayor Capdeville, the police commissioners, Superintendent of Police Journée and of Chief Sylvester, of Washington, president of the association. Short reviews are given of the city's history and of that of the police department.

Periodicals

The May issue of the *Proceedings* of the American Society of Civil Engineers is full of papers of interest to the city engineer. Richard T. Dana presents a paper on the new explosive of the safety kind known as "Jovite," explaining its composition, manufacture and the tests to which it has been subjected without exploding. He also shows the dangers from the use of dynamite and mentions the other safe explosive, "Masurite," which is even safer than "Jovite." The paper on *An Experimental Study of the Resistances to the Flow*

of Water in Pipes, by Augustus V. Saph and Ernest W. Schroder, is extremely technical and presents a number of tables giving the diameter of brass and iron pipes, the loss of head of water for 100 feet of pipe, the velocity, etc. *The Filtration Works of the East Jersey Water Company, at Little Falls, N. J.,* is a discussion of a paper on this subject previously presented by George W. Fuller, and was participated in by Messrs. Allen Hazen, George C. Whipple, J. P. A. Maignen, and others. Mr. John H. Gregory discusses a paper by Charles Anthony, Jr., on *Automatic Modules for Regulating the Speed of Filtration. The Preservation of the Materials of Construction* was the subject of an informal discussion by several members, being continued from the March issue of *Proceedings.* New York, N. Y.

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The *Municipal Journal* of London, for May 15, is a special number devoted to London's electric tramways, just installed. The subject is divided into a number of parts: *The History of the Undertaking,* by J. W. Benn; *The Problem of London's Traffic,* by John Burns, M. P.; *Tramways and Housing,* by S. D. Waterloo; *The Conduit System,* by A. N. Connett, a complete technical description of the construction; *Advantages of the Conduit,* by W. A. Baker; and biographies of the men who have had control of the work. A large number of illustrations of the work are given. All of the proposed lines have not yet been opened, but this section described will prove the entering wedge for municipal ownership of London transportation lines under the control of the London City Council. London, Eng. Price per year, 8s. 8d.

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The Surveyor, for May 8, contains an interesting and instructive paper and discussion on *Cement Testing.* The paper was by David B. Butler, vice-president of the Society of Engineers, who gave the results of tests of cements which proved to be sound, although considerable heat was evolved in setting, while others proved worthless, although no heat was given off at such time. The May 15 number of the magazine had an article on *Lythan Sewage and Refuse Destructor Works,* which described and illustrated how the sewage of the Lytham Urban District is taken care of. The development of the *Town of Ealing* from a small village is told in *The Surveyor,* for May 22. The town owns a number of public utilities, such as public baths, refuse and sewage disposal works, as well as stables, hospital, gymnasium, dwellings for workingmen, etc.

A description of *The London County Council Tramways* appears in the issue of May 29, with illustrations of different portions of the construction work. London, Eng.

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The *Electrical Review,* for May 15, contains an illustrated article devoted to the new tramway undertaking of the London County Council, and illustrations show details of the construction. The issue for May 22 has an article on *The Mersey Electric Railway,* describing the railway that is to run through a tunnel under the Mersey river from Liverpool to Birkenhead. Illustrations show details of construction of cars, electrical controlling devices, and views of the power house, etc. The *New Electricity Works at Worcester* are described in another article.

The May 29 issue contains an extended description of the *Electric Lighting of Aldershot Camp,* the headquarters of the British army. A general plan of the camp is shown, as well as illustration of the machinery and boilers, which are of Babcock & Wilcox type. London, Eng. Price per year, 30s.

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Public Health for May contained a number of articles of interest to the health officer. *"Regulations under the Dairies, Cow-Sheds and Milk-shop Orders"* was contributed by J. Mitchell Wilson, M. D., is a long paper on the care of dairies and is followed by a discussion of the subject by other medical officers of health. H. Meredith Richards, M. D., contributed a paper on *Some Opportunities in Regard to the Control of the Milk Trade. Hygienic Requirements in the Milk Trade,* by Thomas M. Rotch, M. D., outlines the functions of a milk laboratory and the proper care of cows.

The June issue is devoted almost entirely to the subject of diphtheria, and there are articles on *Diphtheria as a Disease of Person, Not of Place, Diphtheria in Relation to Domestic Animals, Prevention of Diphtheria Outbreaks in Hospitals for Children, Variety of the Bacillus of Diphtheria in Which the Micro-organism Resembles the Actinomyces,* and the action of the toxin and anti-toxin of diphtheria on the brain and spinal cord. Joseph Groves contributes *Public Health Administration* to this number, in which he calls attention to the difference in circumstances between different sanitary districts, and that some rules are not applicable to all. London, Eng.

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The Engineering Magazine, for June, contains an article by W. M. Venable on *Power and Pumping Stations of the New Orleans Drainage,* giving, with illustrations, a description of the works that are to supply New Orleans with a sewer system and discharge the sewage into Lake Pontchartrain, etc. New York, N. Y. Price per year, $3.

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E. P. Powell contributes an article to the June issue of *The Arena On the Insanity of the City,* in which he strives to show how the tendency of population was toward urban life during the greater portion of the last century, but that since 1890 the concentration has been dropping off, and people are moving back into the country. The tide, according to the author, has been stimulated by three forces. The first of these is the rural free delivery of mail. The second is the rural telephone, and the third is the trolley, which is destined to supplant the local carrying work of the steam roads and prove the greatest boon to the farmer. These forces are bringing about a reaction to country life, but it is not the old life of pioneer days. "It is a new life, full of applied science." He concludes by saying that all classes are becoming convinced that "the city life is unnatural, and that country life is an institution of God." Prof. Edward W. Bemis writes on *The Significance of Mayor Johnson's Election,* and tells how the Democrats were successful in refuting all criticisms made by the Republicans on Mayor Tom L. Johnson's former administration. He claims that once again it was demonstrated that the masses and not members of churches were the only true friends of economic reform. New York, N. Y. Price per year, $2.50.

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Part 4, Vol. VI., of the report of the sixth annual meeting of the American Park and Outdoor Art Association has been issued. The following papers that were read before the association at its Boston meeting appear in this part: *Parks and Landscape Gardening,* by Byron Lathrop; *Parks and Politics,* by James Jensen; *Park Administration,* by Calvin C. Laney; *Park Building in the West,* by Sidney A. Foster; and *Some Abuses of Public Parks,* by Edward Baker.

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Municipal Reports Received

We have been favored with copies of the annual reports of Gloversville, N. Y., and of Somerville and Framingham, Mass., for the past year.

Chief J. P. Arto, of the Houston, Tex., fire department, sent us a copy of his annual report and of the other departments of the city.

The sixth annual message of Mayor William C. Maybury, Detroit, Mich., and a copy of the manual of Medford, Mass., have been received. The latter with the compliments of City Clerk Allston P. Joyce.

The report of the board of police of Fall River, Mass., has been received.

Superintendent of Streets G. F. Lawton, of New Bedford, Mass., has sent us his annual report for 1902.

Commissioner of Wires Patrick J. Kennedy, of Boston, Mass., has favored us with his annual report for 1902.

The report of the State Board of Health of Connecticut for 1902 has come to hand.

The compliments of State Engineer Edwin A. Bond, of New York, accompany his annual report for 1902.

We have a copy of the "National Electric Code" for 1903, for the installment of electric wiring and apparatus.

TOWN LIGHTING BY ACETYLENE

Extent to Which It Might Be Used—Compared with Water, Gas and Electricity—More Economical and Better Quality

By Augustine Davis

According to reports contained in the "Acetylene Journal," there are now something over fifty towns in the United States lighted by acetylene, the same number in Germany, and about twenty-five in France. With such a number of acetylene installations in apparently successful operation, it would seem that the subject of town lighting by acetylene is worthy of serious consideration by the readers of the Municipal Journal and Engineer.

Extent to Which It Might Be Used

We are informed that there are something over 6,000 towns in the United States of less than 3,000 population, and it is probable that there are very few, if any, in which acetylene cannot be more economically used for lighting purposes than any other illuminant which is distributed from a central station. This being true, it must also be true that nothing more important could be presented to the inhabitants of such towns because every citizen is interested in artificial light.

In prefacing this article with the above statements, we do not mean to exclude the larger towns from the places in which acetylene can be introduced to advantage, because we are confident that it can compete successfully with gas or electricity under almost any conditions. The smaller places are mentioned more particularly because in the smaller towns it is hardly possible to establish an electrical or ordinary gas plant on a profitable basis.

It is almost impossible to make close comparisons of the cost of installation of the various illuminating plants, because the conditions are hardly alike in any two places. We believe that it is generally conceded that the cost of wiring for an electrical plant and piping for a gas plant is practically the same; the difference, if any, being slightly in favor of the latter.

Taking a fifty horse power electrical plant for illustration, using 3,000 feet of distributing wire, the plant, together with the outside wiring, poles and lamps, would cost about $4,000. Such a plant can furnish current for about 400 sixteen candle power incandescent lamps and twelve 2,000 candle power arc lights. It will be understood that an arc light rated at 2,000 candle power will actually give only about 500 candle power.

An equivalent in lighting power to the above plant would be supplied by a 500-pound carbide capacity acetylene gas plant, the difference being that more than one-half of the total candle power would be given by the twelve arc lights, whereas it would be distributed much more uniformly by the use of acetylene.

Compared with Other Illuminants

The cost of coal or water gas installations is so great as to make their use in towns of 3,000 and less practically impossible. We might say, in this connection, that as acetylene has from twelve to fifteen times the candle power of coal or water gas per cubic foot, the mains for general distribution can be of considerably less diameter and consequently of much less cost. With coal or water gas plants eliminated, the only comparison remaining is with electrical plants.

A first-class town lighting plant, with 3,000 feet of gas mains and of 500 pounds carbide capacity, can be installed for from $2,000 to $2,500, or about one-half the cost of an electrical plant of equal lighting capacity.

An attempt to make a comparison in the cost of operation is extremely difficult, owing to the varying cost of fuel in different localities. We think that in plants of so small a capacity as the one used for illustration, it would be impossible to produce a sixteen candle power incandescent light for less than one-half cent per hour for each lamp in actual use. Calcium carbide can be delivered at almost any place in ton lots for $70 per ton, or 3½ cents per pound. Good carbide will yield five cubic feet of gas per pound, which will make the gas cost four-fifths of a cent per cubic foot. The standard acetylene burner consumes one-half cubic foot of gas per hour, which is rated at 24 candle power, the cost to maintain being two-fifths of a cent per hour. To maintain an electric lamp for three hours per day would cost one and one-half cents, or, for a month of thirty days, forty-five cents, for 16 candle power. At two-fifths of a cent per hour for acetylene, the cost per month for the same use would be thirty-six cents for twenty-four candle power. For one year the cost of an electric light would be $5.40, and the cost of acetylene would be $4.32, while acetylene would give one-half more light than the electric lamp. It is a notorious fact that plants in small towns are usually unprofitable, and on this account, that they are not kept in good condition, and the lamps are not renewed as frequently as they should be, consequently the candle power of the lamps in such places is much nearer eight to ten candle power than it is to the rated capacity. Ordinarily a one-quarter foot acetylene burner is nearly equal in lighting power to a lamp rated at 16 candle power. The lighting power of an incandescent lamp constantly deteriorates, while the acetylene jet supplied from a properly constructed generator remains constant.

Economy and Quality

As to the quality of the light, there is no comparison. The incandescent light is of a decidedly reddish tint, while acetylene is pure white and has greater diffusiveness than electricity.

Skilled labor is required to operate an electric plant, while any person of ordinary intelligence can manage an acetylene plant, and only one or two hours labor per day would be required to keep the plant in operation.

A very great advantage which the acetylene plant has over the electric plant in small places is that it supplies light continuously, while with an electric plant it is usual to discontinue the service at somewhere from 10 to 12 o'clock P. M. This necessitates a full equipment of lamps on the premises of every user of the electric light. This is particularly annoying in hotels, schools, hospitals and other places, where there is necessarily considerable use of artificial lights during the hours when the electric plant is not running.

So far as street lighting is concerned, while acetylene plants do not give a sufficiently concentrated light to equal an arc light, by the use of multiple burners the flame can be made of an intensity to illuminate the streets very satisfactorily, especially as the light has such great diffusiveness.

It is not long since that a five-foot burner, with ordinary gas, was used for lighting city streets. The one-foot acetylene burner will give three times as much light as was obtained from these five-foot flames.

A recent report from New Palestine, Ind., where acetylene is used, stated that one-foot burners were at first used for street lighting, but later they were reduced to three-fourths-foot, and that this size of flame gave excellent satisfaction. This report states that thirty-one street lamps were operated for eighty days, commencing on November 7, 1902, and the actual cost of maintaining same was $120, or $1.50 per night, which was a fraction less than five cents for each lamp per night. Such results should certainly establish the practicability and desirability of acetylene for lighting small towns, especially, and we believe that the Municipal Journal and Engineer can do nothing more beneficial than to inform the authorities in these smaller places of the real merits of acetylene for town lighting.

Cause of Prejudice

The progress of acetylene has been very much impeded by the deficient apparatus which has been put on the market and by the unscrupulous character of many of the promoters who have advocated its use. Powerful rivals have taken advantage of these conditions to discredit acetylene, and they have been able to point out many instances of its failure to give satisfaction.

The capacity of an acetylene generator is its heat absorbing capac-

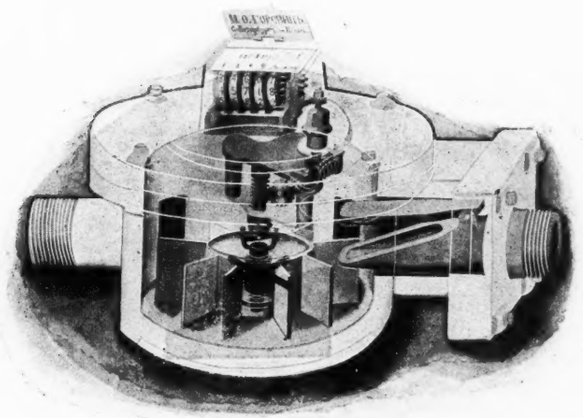
ity. The hydration of one pound of carbide will boil six pounds of water. The overheating of acetylene in generation reduces its luminosity to a great extent, and causes it to form numerous compounds which clog the minute openings in the burners and cause them to smoke and scatter soot. Properly generated acetylene will not stop burners, and the flame at the close of the evening will be just as white and clear as at the beginning of consumption. Notwithstanding these well-known facts, large numbers of generators permitting the unfavorable conditions described are still being put on the market to continue to discredit this meritorious illuminant.

While water feed generators are being discarded by the progressive manufacturers, nearly all of the carbide feed machines used one-fourth-inch carbide, and, although they provide the one gallon of water per pound of carbide, which is required by the rules of the National Board of Fire Underwriters, still, when the consumption is large, the fine carbide does not sink readily in the water of the generation chamber and frequently overheats the gas. Where the lump carbide is used, it has sufficient gravity to sink beneath the surface of the water and prevent such overheating. Town lighting plants which feed lump carbide can now be obtained at very moderate cost, and there is no town so small that acetylene lighting plants cannot be used to advantage. Towns of less than 5,000 population afford most favorable opportunities for profitable investment, and among those best informed, largest development is looked for in this field.

A Standard Water Meter

THERE are numerous kinds of water meters and numerous manufacturers, but there is no water meter better than that made by the Standard Water Meter Company, successors to the Tuerk Hydraulic Power Company, 245 Robinson Street, Brooklyn, N. Y. For more than a quarter of a century this concern has turned out water meters in several styles, including the rotary, disc and velocity. There is no meter better adapted to prevent water waste than this.

The chief use of a water meter is to detect and prevent useless waste of water. Where a meter is not used the householder often —it might be said always—saves a plumber's bill by not having his defective plumbing repaired. In this way thousands of gallons of

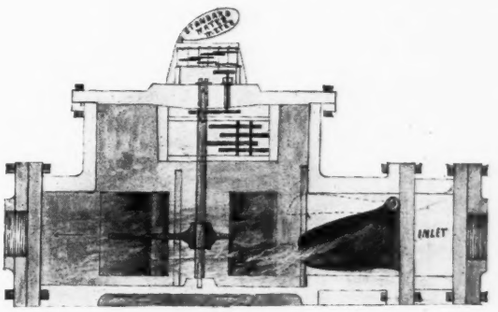


SECTIONAL VIEW OF METER

water run to waste needlessly every day, which, taken in the aggregate in a city like New York, means many millions of gallons at an expense of many thousands of dollars to the taxpayers. If all consumers were compelled to use water meters the waste would be checked; consequently the expense for supplying water would be reduced, which would be also a benefit to the taxpayer.

Two styles of water meters are manufactured by this concern, known as the disc and the current. Under normal temperature and free from grit or sand the disc meter has proved very efficient, but where the water contains any foreign matter, as most waters do, this, like all other forms of displacement meters, is subject to considerable wear and tear, and, therefore, its efficiency deteriorates, for with considerable wear the meter is likely to become so clogged as to stop altogether, oftentimes cutting off the flow of water. The rubber disc used in this and other types of displacement meters is very sensitive to changes of temperature, cracking easily with very cold water and warping when the water becomes warm, in either case the change being fatal to the meter.

The current meter, on the other hand, is free from these defects. It does not measure fine streams as accurately as might be wished



SECTIONAL VIEW OF CURRENT METER

for, but it will stand all kinds of hard usage, and will, on the average, give better results for continuous wear. This type of meter, in the large sizes, say from two inches upwards, shows to the best advantage. It has been on the market now for the past eight years, 99 per cent. of those sold being in use to-day and giving satisfaction. This style of meter is recommended for the reliable measurement of large quantities of water, and competent engineers state that it will measure large quantities with greater accuracy and less wear and tear than any other style of meter.

This Company makes a specialty of hot water meters, and achieved results in this direction which have never been excelled by any other company. Its hot water meter has been placed under very high pressure where it has been subjected to the inflow of steam, but the specially prepared gear trains and other working parts have stood the test most admirably. Its boiler-feed meters are especially adapted for the purposes and no large boiler plant is complete without one. The price is placed at as low a figure as quality of goods would permit, so as to encourage their general use. For instance, a one-inch meter sells for twenty dollars; one and one-half-inch, forty dollars; two-inch, sixty dollars; three-inch, one hundred dollars; four-inch, one hundred and fifty dollars; six-inch, three hundred dollars.

For the benefit of the readers of the MUNICIPAL JOURNAL AND ENGINEER a brief description of the accompanying sectional view of the current meter is given:

The piston wheel is made of aluminium or other light anti-corrosive material, and runs free on hard metal, needle pointed bearings, with ample provision for taking up wear.

The inlet is a weighted check valve, compressing the small or leaking stream, making it register, and it cannot run backwards. All the parts being metal and no rubbing surfaces, it will wear well and not be materially affected by steam, hot or dirty water.

This is positively an anti-friction meter.

The discharge is equal to the full flow of the pipes, and is especially adapted for elevators, hydrants, motors and other large services.

Special rates will be given to water companies, either private or municipal.

Prices for Meters Suspiciously Uniform

THERE have been vague rumors for some time past that a combination or agreement was formed between the large meter companies in order to maintain high prices. The following item taken from the Toledo *Blade,* is interesting in this connection:

"Has a combination of water meter manufacturers been formed to hold up the city?

"The board of public service will devote a few days' time to learning the answer to this question. If necessary, one member

of the board may go to Cleveland, Columbus and Detroit to investigate.

"Bids for 400 5/8-inch meters were opened this morning. There were also propositions for a few meters of other sizes. The bids on the 5/8 meters were as follows:

"Neptune Meter Co., New York	$8.00
"National Meter Co., Chicago.	8.00
"Thompson Meter Co., Brooklyn, N. Y.	8.00
"Hersey Manufacturing Co., Columbus	7.60

"The prices were suspiciously uniform, and President Stollberg's laconic comment was: 'Looks like combination.'

"Superintendent Cook, of the water department, explained that the old water board had paid as much as $9 each for the Neptune company's 'Trident' meters, and that the last purchased cost $8.50, with connections. The price of $8 quoted to-day includes connections.

"It was hinted that Cleveland pays about $7 for meters. Mr. Stollberg said it might pay Toledo to buy its meters from the city of Cleveland.

"Action was finally postponed on the bids until the latter part of the week, when the full board will consider them. Mr. Nolen was absent to-day and he will be in Chicago until Friday transacting business."

An Improved Rail-Paving Block

There is soon to be placed on the market an improved rail paving block, which is likely to come into general use in cities, owing to the fact that it overcomes an obvious defect in the "T" rail, which is so commonly employed in street railway lines throughout the country. The new block was modelled and patented by William H. Arthur, Superintendent of Public Works of Stamford, Connecticut, and was the direct result of Mr. Arthur's official observations regarding the laying of railway tracks through his city. Briefly stated, the advantages of the patent block are the placing of the "T" rail on the same standing with the grooved girder rail, without any of the defects of the latter, which make it so little used in street railway construction work.

Mr. Arthur obtained a patent on his device about a month ago. Railroad contractors and engineers who have examined the model say that it will be a distinct addition to street railway construction and will overcome several obvious shortcomings of the methods now in general use. The patented block is intended to be used in laying a pavement next a rail. It is so arranged that there is practically no chance of the groove along side the rail becoming clogged with dirt or substances of any kind, thus tending to a smoother running of cars, and it is further arranged so that carriage wheels can readily mount out of the groove practically without any liability whatever of slewing along the rail or being wrenched at the axle. It is intended to be placed between the ordinary paving block and the rail. Beside the rail a space is left for the travel of the flanges of the car wheels. The end of the block is provided with an inclined shoulder running off into a toe, which is intended to abut against the web of the rail. The top of the block will be about on a level with the top of the rail, and there will be a space between the top of the toe and the head of the rail, which will permit of ordinary substances which gather in such a groove being pressed out of the way under the head of the rail as the flanges of the car wheels pass along. It is obvious that this will insure a very even motion to the car and will reduce to a minimum any jolting of passengers.

There is a raised rib on the central portion of the inclined shoulder. When the blocks are placed in position the space between these ribs is sufficiently wide to allow a carriage wheel to mount out of the groove and cross the rail without any difficulty whatever. The tire of the wheel will strike a rib and thereby secure a grip on the pavement, and there will be absolutely no liability of wrenching the wheel. With this arrangement, the "T" rail will be in this respect just as serviceable as the grooved girder rail. The block may be made out of any material.

The importance of this invention of Mr. Arthur lies in the fact that it overcomes the only serious objection that is found with the "T" rail in city streets, otherwise it is conceded to give much better service than the grooved girder rail. In referring to the "T" rail, Pratt and Alden say:

"It is cheaper, for the price per ton is less than the girder rail, and owing to the absence of the tram or groove, and also owing to its symmetrical section, a much lighter rail may be used than in a girder track under similar conditions, at the same time obtaining an equally substantial track."

"It is easier to lay, for, the section being symmetrical, the application of the joints becomes a simpler matter, although this requires careful attention in all track-laying. Easy curves may be sprung in, and sharper ones be laid by means of a portable bender, with a greater certainty of the track keeping its alignment than with girder rails. Then there may always be found a greater number of trackmen familiar with the laying of "T" rails than girder. These points are of vast importance, for on them depends the durability of the track, more than upon the shape of the rail or fastenings or any other feature."

"It has a cleaner head, owing to the absence of the tram and groove of the girder rail. It offers no attraction to street traffic, and if properly laid in a well-macadamized, brick-paved, or asphalted street, the track will usually be found in a much better condition than with any girder rail."

"The last two conditions contribute, of course, to a better track in every way for operation, for track frictions are reduced to a minimum. And since the track surfacing is not hampered by street grades, the outer rail of curves may have its proper elevation, and cars may run at the maximum speed at all points."

Increasing Popularity of Medina Block

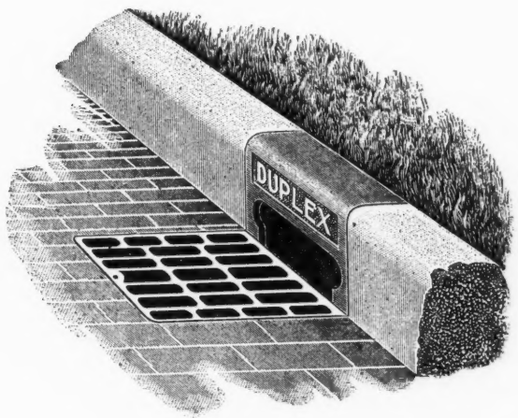
In the search for a pavement best suited to the heavy grade on the approach of the new Williamsburgh Bridge, across the East River, one which would be durable and smooth, but not slippery, it was finally decided to use Medina block. This choice was made, notwithstanding the fact that granite block had always been used on the approaches of the Brooklyn Bridge. While the durability of granite block was not questioned, it was considered inferior to Medina block for the reason that it always wears round and becomes slippery. On the other hand, Medina block always wears even and does not become slippery; hence it is sure to afford a good foothold for horses, a requisite, owing to the steep grade, which would be essential to any form of pavement used on the approach of the new bridge.

In referring to the use of Medina block, a leading engineer recently said: "When Medina block is thoughtfully compared with granite, and when the qualities of the two paving blocks are carefully considered, I wonder that any one should hesitate in selecting Medina stone. I have seen Medina block as it has been laid at Cleveland and Rochester, where it has been subjected to heavy traffic, and where it has stood the test and given every evidence that could be expected, thoroughly demonstrating its efficiency, quality, durability and non-slipperiness. It is surprising, when all these points of merit are considered, that Medina block is not more extensively used."

Recent contracts have been awarded to the Medina Quarry Company, 150 Nassau street, New York, for forty thousand square yards of Medina block and stone for cross walks in Brooklyn, used by the city, besides which the Brooklyn Rapid Transit Company has ordered four hundred thousand blocks for paving between the rails of its track. Other orders have been received from Cohoes, N. Y., and elsewhere, besides an order for sixteen thousand feet of Medina stone curb from Harrisburg.

Combination Curb and Gutter

THERE never was a time when such careful attention was given to the construction of sanitary sewer systems. The larger cities are constantly demanding improvements, not only in the general sewer system work, but more particularly in the equipments used for manholes, inlets, etc. The new inlets made by the Duplex Manufacturing and Foundry Company, New England Building, Cleveland, Ohio, are carefully designed and thoroughly constructed, and it is confidently asserted by those who know that the products of this concern will meet the test of any municipality, no matter how severe it may be. The accompanying illustration gives a view of the combination curb and gutter.



Art Metal Office Furniture

THE time was when the valuable plans, drawings, etc., relating to the laying out and developing of a municipality were so few that they could be tucked away in a small corner of any ordinary fire-proof safe, but the rapid growth of cities of necessity has multiplied such matter to a large degree, and, in consequence, little or no attention has been given to their preservation from fire. This is more true of the valuable plans, drawings, and other documents to be found in the engineering department than in any other department of municipal service, although they are by no means the least valuable.

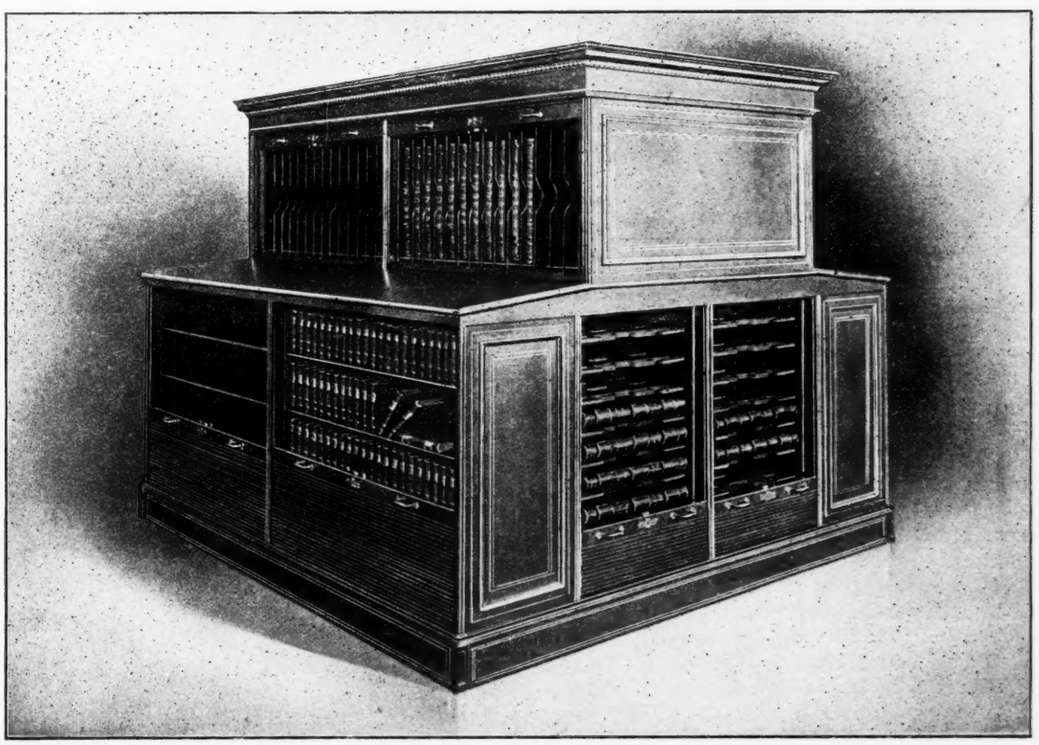
Happily for the future welfare of our cities, authorities are beginning to realize the necessity of protecting their valuable documents, and particularly where new public buildings are erected. Among the latest to be placed on the honor roll in this connection is the city of Minneapolis, which has given special attention to this feature. The city engineer's department is very completely supplied with steel cabinets, insuring protection for valuable plans and records. The accompanying illustration shows the steel desk cabinet for house books, sewer records, etc. It is both desk and cabinet, and, being placed outside the vault, has all openings protected by steel curtains. The equipment was furnished by the Art Metal Construction Company, of Jamestown, N. Y. This concern issues many beautiful catalogues, and will, no doubt, be glad to furnish any of them on application, as well as estimates on special work.

A New Asphalt Company

THE organization of the Toledo Construction and Supply Company under the laws of the State of New Jersey, with a capital stock of $300,000, is a merger of the Toledo Asphalt Patcher Company and the Economic Asphalt Repairs Company, of Denver, according to our Toledo correspondent. The incorporators are as follows: C. E. B. Lamson, of the firm of Lamson Brothers; Judge I. I. Millard, formerly of the Lucas County Probate Court; Alfred C. Neel, who is at the head of a big Mexican rubber company; Herman Merriman, an expert asphalt man; C. H. Burchinal, president of the Lake Erie Asphalt Paving Block Company; and Charles R. Clapp, a Toledo attorney.

The directors of the new company will be Frank H. Steel, George W. Tonson, Judge I. I. Millard, C. E. B. Lamson, C. H. Burchinal, Alfred C. Neel, Charles R. Clapp and George H. B. Martin. The latter is a resident of New Jersey, while Mr. Steel is manager of the Paragon Oil Refining Company.

This is said to be one of the most important deals in Toledo which has occurred this year. It has been stated that the directors have



ART METAL OFFICE FURNITURE—STEEL DESK CABINET

secured Mr. George W. Tonson, whose term as city engineer is about to expire, as general manager. It is understood, however, that Mr. Burchinal will retain an active interest in the new business.

The present plant of the Toledo Asphalt Patcher Company will be greatly enlarged in capacity and a downtown office will be established.

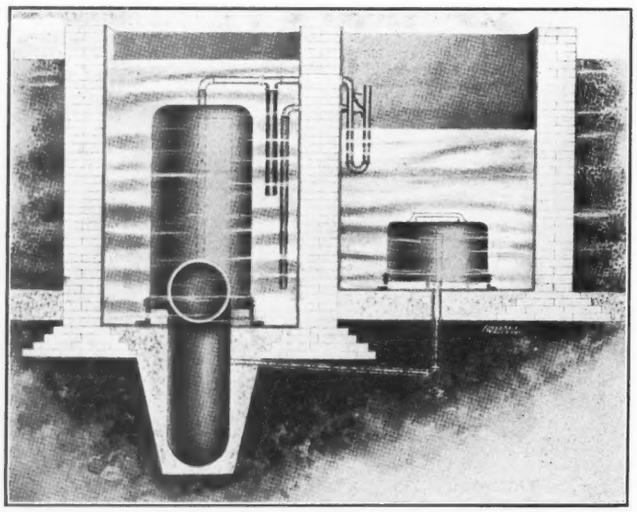
Mr. Charles R. Clapp, in referring to the new corporation, recently said:

"The purpose of the company will be that of a general construction company, manufacturing and handling machinery for municipal and public improvements, especially for the building, repair and maintenance of sheet asphalt. It is also the intention of the company to do extensive street contract work, both in this State and in other States. It can be readily seen that this combination means a very strong aggregation of Toledo capitalists, and the ability of this company not only to enter aggressively into sheet asphalt contracting and repair work, but also asphalt block, brick, macadam and all kinds of street paving contracts, together with the ability to handle materials and machinery for all kinds of municipal and public construction is very apparent."

Siphonic Apparatus for Sewage Filters

In all places where sewerage has been or is to be installed, the question of the proper purification of the sewage has to be given serious thought, and in many localities the laws of the State boards of health have made imperative some definite action by the authorities in charge.

Competent engineers should be employed to advise what method



of sewage purification is best adapted to particular needs and to properly design the system.

Officials cannot be too careful in these matters, for the reason that what would fit one need might not be proper for another.

The rapidly increasing necessity for some suitable method of sewage purification has demonstrated the need of simple and reliable apparatus for automatically operating and controlling these plants.

To meet these needs, the Pacific Flush Tank Company, of Chicago, Ill., has acquired the United States patent rights of Mr. Samuel Henry Adams and Mr. Moses James Adams, of England, which, together with the inventions recently made by Mr. Sidney W. Miller, enables it to furnish siphonic apparatus of every description for the automatic operation of bacterial sewage filters.

In this new field of operation it will endeavor to sustain the reputation earned in furnishing reliable siphonic apparatus for flushing street sewers throughout the country.

The accompanying illustration is known as the Miller Timed Siphon, style No. 1, and is designed to hold back the sewage in the contact bed for any desired length of time, and then to discharge its contents onto a fine filter bed, another contact bed, or to the final outlet.

Special estimates or inforamtion will be furnished by the company on application.

The Menzies' Street Cleaning Device

A short time ago the factory building of the Menzies Street Cleaner Company, of Glens Falls, N. Y., was totally destroyed by fire, which put the Company out of business for a few days. The factory is now running full time and the Company will soon be able to catch up with its orders.

THE DIRT-PAN EASILY EMPTIED

Last year this machine was fully described in the Municipal Journal and Engineer, since which time some important improvements have been made. For instance, it was found that the iron wheels did not give as good satisfaction as a thoroughly-made wooden wheel and the latter is now being used instead. The dust pans are being made of a heavier grade of galvanized iron, which makes them much more durable. Taken altogether the machine now being turned out by this factory is stronger and more satisfactory in every way than the type of last year. The accompanying illustration shows how the machine works.

It is claimed that a workman with this machine can keep clean about 50 per cent. more street surface under all conditions than with any other machine or contrivance on the market, excepting horse or power machines, and will save its cost in a short time.

The time consumed in shoveling the dirt into the can, or other receptacle, by the other methods, is saved by the use of this machine.

It dispenses with the use of the shovel and scraper. The refuse is deposited in the can or bag with one motion. It is neat, clean, strong and durable. With proper care the machine will last for years; in fact, the only part subject to much wear is the dust pan and blade, which can be replaced at slight expense.

This machine is designed principally to clean streets of cities and villages, but it is admirably adapted for other purposes. For keeping particularly recommended. Also, for depots and public places and in the driveways and walks of parks and cemeteries clean, its use is the care of driveways and walks around large private residences and hotels.

It is used in over one hundred cities and villages, among which are the following: Washington, D. C.; Newport, R. I.; Hudson, N. Y.; New Haven, Conn.; Saratoga Springs, N. Y.; Boston, Mass.; Marion, O.; Glens Falls, N. Y.; Schnectady, N. Y.;

SWEEPING REFUSE ONTO THE DIRT-PAN

Bay City, Mich.; New Bedford, Mass.; Johnstown, Pa.; Baltimore, Md.; Quincy, Ill.; Marinette, Wis.; North Adams, Mass.; Harrisburg, Pa.; Bridgeport, Conn.; State Reservation, Niagara Falls, N. Y.

For prices, terms and other information address the Menzies Street Cleaner Company, Glens Falls, N. Y.

♣

Economy in Acetylene Gas Lighting

THERE are many villages and towns in the United States, of from one to five thousand population, which are employing the most expensive system for lighting their streets, namely, electric light. It is not only expensive but inefficient to a large degree, particularly in the summer time, when the trees are in full dress. It has been repeatedly demonstrated of late, that it is bad practice to use high candle-power arc lights for illuminating residential streets, and it has been as repeatedly shown that more efficient lighting can be secured with the use of from twenty-five to sixty candle-power lamps, distributed from one hundred and twenty-five to one hundred and fifty feet apart.

In this connection the readers of the MUNICIPAL JOURNAL AND ENGINEER will be interested in a statement of The J. B. Colt Company, of New York, on the "Economy of Acetylene Gas Lighting," as follows:

"At the present price of carbide, $70 per ton (one ton yielding on the average 9,000 cubic feet of gas, which gives 450,000 candle-power hours), 50 cents worth of Acetylene, as a little figuring will show, gives 3,214 candle-power hours, as against 3,200 candle-power hours for 1,000 cubic feet of common gas, burned in an Argand burner. In out-lying towns where the consumer still pays $1.25 and upwards per 1,000 feet, the following comparative tables, prepared by eminent authorities, represent the facts more truthfully. An eminent authority has shown that for large lighting the saving in favor of Acetylene is as follows:

Radiant.	Cost per Thousand.	C.-P. Hours.	C.-P. Hours for $1.	Cost of 1,000 C.-P. Hours.	Equal to City Gas per 1,000 at	Saving in Favor of Acetylene.
City gas, argand, cubic feet.....	$1.25	3,200	2,560	$0.39	$1.25	62 p. c.
Gasoline, argand, cubic feet.....	.75	2,400	3,200	.31	1.00	52 p. c.
Electricity, watts	.25	400	1,600	.62	2.00	76 p. c.
Acetylene, open flame, cubic feet..	7.50	50,000	6,700	.15	.48	

"Another authority has shown that for small lighting the saving in favor of Acetylene is as follows:

Radiant.	Cost per Thousand.	C.-P. Hours.	C.-P. Hours for $1.	Cost of 1,000 C.-P. Hours.	Equal to City Gas per 1,000 at	Saving in Favor of Acetylene.
City gas, open flame, cubic feet..	$1.25	3,000	2,400	$0.42	$1.25	52 p. c.
City gas, argand, cubic feet.....	1.25	4,000	3,200	.31	1.00	40 p. c.
Gasoline, argand, cubic feet.....	.75	2,400	3,200	.31	.93	36 p. c.
Electricity, watts	.25	400	1,600	.62	2.00	76 p. c.
Acetylene, open flame, cubic feet..	10.00	50,000	5,000	.20	.60	

♣

St. Louis Paving Brick

DAME NATURE has been particularly friendly to the St. Louis Clay Burning Company, whose plant and factory are located at Clayburn, Mo., about sixteen miles from St. Louis. It has given the happy combination of shale, coal and fire clay, all in one thirty-five acre tract of land owned by the Company. The shale is sixty feet in depth and the fire clay about sixteen feet, and there is a vein of coal two feet in thickness. This is really a unique situation. We do not know where such conditions can be duplicated, and for this reason the company is to be congratulated upon its possessions.

There are about fifty brick plants scattered throughout the country, but none which turns out a better quality of paving brick than that made by this concern. Its prosperity has been all that could be desired in the past, and the business for the coming season, already in sight, promises even better things than last year. Its volume of business for paving brick and vitrified sewer bottoms is enormous; so much so that the Company finds it necessary to devote all its energies to this particular branch of the business.

The secretary and general manager of the plant, Mr. Walter Shields, recently said to a MUNICIPAL JOURNAL representative that the Company had been compelled to turn down several orders for building brick, one of them amounting to 5,000,000. Although the Company is equipped with the most modern machinery and has an enormous output, yet the demand largely exceeds the supply. Mr. Shields said: "We have all we can do and have been so successful on paving brick and sewer bottoms that it takes all our time and attention to look after it properly."

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Notes of Interest About the Trade

—The American Spiral Pipe Works, of Chicago and New York, have recently issued a neatly bound forty-page illustrated catalogue and price list which enumerates the various sizes of its pipes, valves, etc., and includes a lot of useful tables on hydraulics. The Chicago address is 1173 South Paulina street; New York, 26 Cortlandt street.

—The new illustrated catalogue of the Climax Road Machine Company, of Marathon, Cortland County, N. Y., has thirty-two pages and tells all about the Climax reversible road machine and its various uses, the Climax stone and ore crusher, the Climax automatic distributing wagon, the Climax new reversible horse roller, etc., etc. It contains much useful information about road-making machinery.

—Superintendents of private and municipal electric light plants will be interested in the new 510-page illustrated general catalogue of electrical supplies just issued by the Ewing-Merkle Electric Company, 1106 Pine street, St. Louis, Mo. It is bound in cloth and attractively gotten up.

—Under the title, "List of Users, Reynolds Corliss Engines," the Allis-Chalmers Company, Chicago, Ill., in catalogue No. 61, gives a partial list of the users of the Reynolds Corliss engines. The size of this list can be better appreciated by the fact that 190 pages, size 5¾ x 4¼ inches, are necessary to make the enumeration. The booklet is attractively gotten up and bound in paper covers.

—The Acme Road Machinery Company, Frankfort, N. Y., has issued a new catalogue having eighty-eight handsomely printed and illustrated pages, telling all about the road-building machinery and contractors and township supplies manufactured by this well-known company.

—The dipper dredges manufactured by the Bucyrus Company, of South Milwaukee, Wis., are fully described and illustrated in catalogue No. 2, which is handsomely printed and bound in cloth. There are forty-eight pages in all, with numerous full-page plates showing the dredges at work.

—Recent orders received by the United States Wood Preserving Company, of 29 Broadway, New York, for paving with their creoresinate wood block, include 10,000 square yards of paving on several important thoroughfares in Brooklyn as well as 2,000 yards additional for a private contract in the same city; also paving five bridges for the city of Baltimore, as well as the Metropolitan avenue bridge over Newtown Creek, Brooklyn; the new Mattapan Bridge in Boston, and the Elm street bridge in Waltham, Mass. The company has also secured contracts for paving streets in Jamestown, N. Y., and Hartford, Conn., as well as bridges in Lowell, Mass., Rome, N. Y., and Utica, N. Y. The new ferry boats which the Erie Railroad Company is now building will have their driveways paved with creoresinate wood block.

—The London County Council at a recent meeting closed a contract with the British Westinghouse Company, amounting to about $590,000, and calling for two hundred tramcars which are to be used on its lines south of the Thames. This is the largest order ever given for electric cars in England. One-half of the cars are to be of the single-truck type, thirty-two tenders having been received for these. The remaining one hundred, for which twenty-six tenders were received, will be double-deck, bogie-truck tramcars, which

are to be delivered in twenty-eight weeks. This order was secured by the Westinghouse Company against strong competition by foreign manufacturers.

—A well illustrated twenty-four-page catalogue, telling all about asphalt rollers and various other road making machinery manufactured by Julian Scholl & Company, 126 Liberty street, New York, has just been received.

—"From Steelton to Mandalay" is the title of a handsome brochure, profusely illustrated, issued by the Pennsylvania Steel Company, Steelton, Penn., descriptive of some of the work of the bridge and construction department. It tells all about the transportation of the material and construction of the Gôkteik Viaduct, which is located four hundred and sixty miles from Rangoon, and ten thousand five hundred and ninety-nine miles from Steelton, by the way of the Suez Canal. Comparatively little space is given to letter press, as the story is more completely and graphically told by the half-tones which are used in great number to show the various stages of the work. The brochure is really a work of art.

—Messrs. P. M. Lincoln and J. W. Farley, representatives of the Westinghouse Electric Manufacturing Company, read papers before the thirteenth annual convention of the Canadian Electrical Association, held at Toronto, June 10, 11, and 12; the subject of the former being "The Training of the High Tension Engineer," and of the latter, "Transformers for High Voltage Transmission Lines."

—The General Fire-Proofing Company, of Youngstown, O., has just received a contract from the First National Bank of Chicago for its complete equipment with "allsteel" furniture, at an approximate cost of $75,000. It is said that these bank rooms, when completed, will be the largest in the world.

—The works of the National School Slate Company, of Slatington, Penn., have been equipped by the D. F. Sturtevant Company with complete heating and ventilating apparatus, using the hot-blast system. The air is drawn through a steam-pipe heater by a fan, direct-connected to a horizontal, side-crank engine. The heater is built in five sections, one of which is designed to use the exhaust steam from the engine.

CONTRACT NEWS FOR THE MONTH

Including Paving, Sewerage, Water Supply, Lighting, Public Buildings, Sewage and Garbage Disposal, Fire Supplies, Contracts Awarded

N. B.—All news of proposed work sent us by city officials is incorporated in our Weekly Advance News Service and appears subsequently in this "Contract News for the Month" if the date of the reception of bids be sufficiently late to warrant placing the item here.

City officials and others are urged to send us all news of contemplated improvements for use in our Weekly Bulletins which are mailed to those interested.

PAVING

Abington, Mass.—It has been stated that the road to Brockton would be extended at a cost of $4,000.

Albany, N. Y.—Schuyler street will be paved with brick. City Engr. Melius.

Asbury Park, N. J.—The building of a speedway has been under consideration.

Athens, Ga.—In July a vote will be taken on the issue of paving bonds to the amount of $100,000.

Augusta, Ga.—A boulevard will be planned for the suburbs as outlined by Col. D. B. Dyer.

Baltimore, Md.—The Council has ordered asphalt block paving on Union Square and Ensor street, and asphalting on North Avenue and McCulloch street.

Bay City, Mich.—The cost of brick on Cass avenue has been placed at $25,440. To lay brick on Washington street, $46,137.

Bay City, Tex.—$15,000 in bonds will be issued for streets.

Beaver Falls, Pa.—Considerable paving for this place is contemplated.

Berkeley, Cal.—Several streets are to be macadamized, according to reports.

Bloomfield, N. J.—Road improvements are contemplated to the amount of $10,000.

Bryan, O.—Bids are wanted July 2 for 47,167 square yards of brick on several streets. Village Clerk Holmes.

Butler, Pa.—$40,000 will be spent, according to reports, on paving and sewers.

Canonsburg, Pa.—Plans for paving are in course of preparation. City Engr. Taylor.

Cincinnati, O.—A number of streets will be paved, asphalt and brick being used.

Clifton Heights, Pa.—$17,000 in bonds will be issued for street improvement. Clerk, Borough of Aldan.

Cohoes, N. Y.—The extension of Vliet street is being planned. City Engr.

Columbus Grove, O.—Brick or block will be used for paving Sycamore street.

Denver, Colo.—The asphalting of 20th street was petitioned.

Derby, Conn.—Bonds to the amount of $75,000 can now be issued for improving the streets, etc.

Des Moines, Ia.—39th street will be paved with brick; Franklin street with asphalt, and Third street with brick.

El Paso, Tex.—$20,000 in bonds will be issued for street improvements.

Fitchburg, Mass.—The paving of Summer street is contemplated.

Fort Worth, Tex.—Several streets will be paved with asphalt.

Franklin, Mass.—One mile of road will be built at a cost of $6,000.

Fremont, O.—The question of paving is being discussed. Mayor Engler.

Geneva, O.—Bids are wanted July 2 for $4,500 bonds for street improvement. Village Clerk Crowther.

Grand Rapids, Mich.—Plans for the drive from Turner street to Mill Creek are ready. County Surveyor Williams.

Grass Valley, Cal.—One street is to be macadamized. Supt. Streets Shearer.

Hamilton, Ont.—$100,000 has been voted for streets, a water system and bridge. City Clerk Beasley.

Hartford, Wis.—The issue of $12,000 in bonds for paving Main street has been under consideration.

Hartford City, Ind.—It is reported that bids are wanted for 11,000 square yards gravel road. D. A. McMichael, Engr.

Harmony Grove, Ga.—Improvement of roads has been considered.

Helena, Ark.—Cherry street will be paved with brick at a cost of $50,000.

Henderson, N. C.—The city has voted to issue $40,000 in bonds for the improvement of streets and sewers.

Hoboken, N. J.—Nine streets will be improved at a cost of $237,000.

Johnson City, Tenn.—$25,000 in bonds was issued for roads, walks and schools.

Joplin, Mo.—The grading and macadamizing of seven streets is contemplated. T. W. Cunningham, Mayor.

Lakewood, O.—Brick will be laid on several streets. Village Clerk Sensel.

Lancaster, O.—Wheeling street will be paved with brick.

Leavenworth, Kan.—Several streets are to be paved.

Logansport, Ind.—Two miles of North street will be paved with asphalt. City Engineer Troatman.

Los Angeles, Cal.—Hill street may be paved with asphalt. Petitions have been made for asphalt on Central avenue.

Louisville, Ky.—The Kentucky & Indiana Construction Company has been incorporated and will manufacture cement.

Lowell, Mass.—An additional appropriation of $10,000 has been made for state highway.

McHenry, Ill.—A twenty-mile boulevard will be built around Geneva Lake at a cost of $100,000.

McKeesport, Pa.—More roads are to be improved in Versailles township.

Maquoketa, Ia.—A few blocks will be repaved. City Clerk Fleming.

Marlin, Tex.—Street paving is under consideration.

Marshalltown, Ia.—Asphalt will be laid on several streets.

Martinsville, Ind.—Twelve miles of gravel road will be built in Gregg township. Audt. of Morgan Co.

Mt, Vernon, Ind.—Nine miles of stone road will be built in Harmony township. County Commissioners.

New Bedford, Mass.—An appropriation of $75,000 has been made for streets and highways.

New Philadelphia, O.—Sundry streets will be improved. A. S. Keplinzer, City Clerk.

No. Albany, N. Y.—Repaving and walks for DeWitt street are under consideration. Common Council.

No. Snyder, N. S.—$120,000 will be spent on streets, etc.

Omaha, Neb.—The Board of Public Works will estimate the cost of municipal asphalt plant.

Oshkosh, Wis.—Bids are wanted July 2nd for asphalt on Algonia street at a cost of $60,000. City Engineer G. A. Randall.

Paxton, Ill.—Brick will be laid on two streets. City Engr. Helman.

Paducah, Ky.—The estimated cost of brick paving on two streets is placed at $11,000. City Engineer Washington.

Peoria, Ill.—The cost of brick on four streets is to be ascertained. City Engineer.

Pittsfield, Mass.—It is possible that $6,000 will be spent on Greylock roads.

Rensselaer, Ind.—Bids are wanted July 10 for Hanging Grove gravel road —seven miles. Board Co. Commissioners.

Roanoke, Va.—Bids are wanted July 2nd for grading, gutters and macadamizing of six streets. City Engineer Wingate.

Rochester, N. Y.—Paving on Central avenue is contemplated. Mayor Rodenbeck.

Rock Island, Ill.—The cost of paving 29th street is placed at $6,809.

Rockville, Ind.—Plans have been prepared for three roads in Union Township. A. Pickett, Engineer.

St. Albans, Vt.—Plans for walks on two streets have been prepared by City Engineer Lincoln.

St. Clair, Mich.—$30,000 can be spent for paving St. Clair street.

St. Joseph, Mo.—Four streets will be resurfaced and six streets graded; seven streets will be paved with brick and one street with macadam.

St. Louis, Mo.—The city will soon build eighty-two miles of asphalt, granite, brick, etc., pavements, to cost about $50,000 a mile. Locust street will be repaved.

St. Paul, Minn.—The lowest bid for paving on Mississippi and E. 7th street was received from Fielding & Shepley, same being $42,000.

San Diego, Cal.—Fifth street will be paved with asphalt. City Engr. Hemeconst.

San Francisco, Cal.—A drive on the shore of Golden Gate at a cost of $500,000 is being considered.

Schenectady, N. Y.—Improvements will be made in the outlying streets.

Sisterville, W. Va.—$30,000 will be spent on a road. W. R. Staple.

So. Norwalk, Conn.—East Washington street will be paved with brick.

Stamford, Tex.—$30,000 is contemplated for street improvements.

Tacoma, Wash.—The paving of Pacific avenue is contemplated.

Terre Haute, Ind.—Brick will be laid on two streets.

Valdosta, Ga.—Several streets will be paved with brick, the cost of which is estimated at $25,000.

Versailles, Ind.—Ten miles of gravel road will be built in three townships.

Vincennes, Ind.—Bids are wanted for twenty-one miles of gravel road. Commissioners of Knox County.

Warren, O.—A resolution has been passed by the City Council for the paving of two streets. Mayor Sloan.

Warrensburg, Mo.—Bids will soon be asked for the macadamizing of two miles of streets.

Williamsport, Pa.—$16,500 in bonds will soon be issued for streets and sewers.

Winamac, Ind.—Ten miles of road are to be rebuilt. County Commissioners.

Winnipeg, Manitoba.—The city may pave and lay sidewalks on twenty-nine streets at a cost of about $49,227. City Clerk Brown. Bids for the same will soon be asked, according to reports.

Woodbury, N. J.—Cooper street will be paved with brick.

Winton, Place, O.—Bids were asked June 30th for $3,000 worth of street improvement bonds. L. G. Dittoe, 514 Main street, Cincinnati.

Wooster, O.—A resolution to improve E. North street has passed the Council. J. O. Fritz, Clerk.

Worcester, Mass.—$10,000 will be spent on Holden road.

Wynnewood, Ind. Ter.—$5,000 will be spent on good roads.

Youngstown, O.—Walks in several streets will be built, and four streets improved. P. W. Hubler, Clerk.

CONTRACTS AWARDED

Albany, N. Y.—The contract for resurfacing Broadway with asphalt has been let the Schenectady Contracting Company for $2.75 per square yard; entire cost, $17,940.

Ashland, N. H.—L. E. Pike & Son, Manchester, have been awarded the contract for 8,000 square yards of paving.

Birmingham, Ala.—Byron & Sanders have received the contract for walks at $4,180.

Bluffton, Ind.—The contract for gravel roads has been let A. Hersher.

Boston, Mass.—McGawley & Coughlin have been awarded the contract for granite block on Massachusetts avenue, at a cost of $11,000.

Camden, N. J.—J. R. Shanley, Philadelphia, bid the lowest for 1⅛ miles of macadam road.

Cape May, N. J.—The contract for 2½ miles of boulevard, etc., has been let Dietrich & Bowser, of Philadelphia, at $200,000.

Charlotteville, Va.—Ringwold & Smith, of Chillicothe, O., have been awarded the contract for 75,000 yards of street paving, at $76,000.

Chicago, Ill.—P. Agnew has the contract for paving several streets.

Cumberland, Md.—The contract for grading and paving 14,000 feet on Green street has been let Fred. Perry at $12,000.

Dandridge, Tenn.—Fred Netherland has been awarded the contract for four miles of macadam road.

Denver, Colo.—A contract has been let the Colorado Paving Co. for asphalting 104th street, at $1.40 per square yard.

Detroit, Mich.—The contract for paving several streets has been let G. E. Curry.

Duluth, Minn.—G. W. Preston bid the lowest for paving Michigan street.

Erie, Pa.—The contract for Kentucky rock asphalt on Chestnut street has been let John McCormack & Son, for $1.47.

Geneva, N. Y.—Contract has been let R. W. Henson for brick on Wadsworth street.

Gloversville, N. Y.—Contract has been awarded A. M. Banker for 3,500 square yards of brick, at $8,396.

Grand Rapids, Mich.—Contract for improving 12th street has been let G. Boice for $7,570; Tremont street to Richard Pickett for $2,500; Madison avenue to Klute & Vandeween for $8,440; Widdicomb street to D. W. Boice for $2,757.

(Continued on page 30.)

ENGINEERS, CONTRACTORS, ETC.

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Lebanon, Ind.—Kernodle & Miller have been awarded the contract for gravel road, cement walk and brick gutters on Busby street, at $3,281. City Engineer Fulwider.

Lewiston, Idaho.—Contract for wagon road (seventy-two miles long) let to F. Johnesse, Northwestern Bridge & Construction Co., at $36,500.

Madison, Wis.—Nicholas Quinn has been awarded the contract for macadamizing Park street.

Memphis, Tenn.—The contract for granolithic sidewalks, curbing and gutters, to cost about $40,000, has been let the Miller Paving Co. by the Annesdale Park Co. R. B. Snowden, President.

New York, N. Y.—The U. S. Wood Preserving Company received the contract for paving the Williamsburg Bridge with creo-resinate wood block, at $31,989.

No. Adams, Mass.—Contract for Porter brick on Union street has been awarded H. C. Wood & Co., at $2.45 per square yard.

Port Townsend, Wash.—Peter Coons has received the contract for grading at Fort Worden.

Richmond, Va.—The contract for asphalt block paving on Franklin street and for granite spoll guttering has been let Charles Gasser, for 84 cents.

Rochester, N. Y.—Contracts for paving of West street let to Rochester Vulcanite Pavement Co. for $20,210; for cement walks on Second street to Ripton & Murphy for $1,300. Board Contractors. The Rochester Vulcanite Company has received the contract for paving Almira street, at $8,200.

Rome, N. Y.—The Barber Asphalt Company has received the contract for two streets, at $65,000.

Seattle, Wash.—Contract for walks on Washington street and twelve avenues has been let the Coast Concrete Co. The contract for concrete walks on 15th avenue has been let Frank & Brandon; for grading Mercer street, to J. W. Fitts & Co.

So. Norwich, Conn.—Contract for brick on Washington street has been awarded C. W. Blakeslee & Sons, New Haven.

Valdosta, Ga.—The contract for paving with brick has been let the Southern Paving & Construction Co., of Chattanooga, Tenn.

Versailles, Ind.—The contract for nine miles of road in Johnson township has been let Steinitz & Voltz.

SEWERS

Annapolis, Md.—New sewers will be built at this place. Mayor Du Bois.

Ann Arbor, Mich.—Sewers will be constructed here, for which $20,000 in bonds will be issued.

Ardmore, I. Ter.—Three miles of sewers will be constructed.

Armourdale, Kan.—The estimated cost of a sanitary sewer system here is placed at $50,000.

Atlanta, Ga.—Bids will be asked July 20th for extending the trunk sewers. City Engineer Clayton. 25,000 feet of sewer extensions with a purification plant will be built. The Mayor.

Beaver Falls, Pa.—A sewer system will be installed here. The Mayor.

Bismarck, N. D.—The cost of installing the sewer system is placed at $50,000.

Bordentown, N. J.—A sewer system is under consideration by the citizens. Board of Health.

Columbus, O.—Sewers and a pumping station will be built at this place.

Compton, Ill.—The citizens are considering a sewer system.

Cottage Grove, Ore.—A sewer system will be constructed. C. M. Collier.

Easthampton, Mass.—The cost of installing a sewer system is placed at $40,000. The plans for the trunk sewer will be made by McClintock & Woodfall.

Lancaster, Pa.—Bids are asked July 1st for $191,000 sewer and water bonds. J. H. Rathfor, Comptroller.

Marshfield, Wis.—Sewers will be constructed, for which $40,000 in bonds will be issued.

Marysville, Cal.—A sanitary sewer system to cost $64,000 is being talked of.

New Albany, Ind.—A sewer system will be planned here.

New Bedford, Mass.—$12,200 has been appropriated for sewer purposes. The Mayor.

Newport, R. I.—Better sewerage on Bath Road and some others has been considered.

No. Vancouver, B. C.—Bids are wanted August 1st for sewers, according to reports.

Ottawa, Ont.—A vote was taken June 9th on the question of sewers.

Pasadena, Cal.—It is possible that Colorado and two other streets will be sewered.

Penn Yan, N. Y.—Plans for a $75,000 sewer system are under consideration.

Presque Isle, Me.—Sewers for this place have been talked of.

Ripley, N. Y.—Sewers in five streets have been under consideration.

Tamaqua, Pa.—Bonds to the amount of $25,000 will be issued for a sewer system.

Taylorville, Ill.—The following sewers will be laid: 5,280 feet of 16-inch; 3,660 feet of 12-inch; 4,559 feet of 10-inch; 660 feet of 8-inch, and 800 feet of 6-inch pipe. City Engineer A. B. Alexander.

CONTRACTS AWARDED

Aberdeen, S. D.—The contract for extension to the sewer has been let James Kennedy, of Fargo, at $17,000.

Altoona, Pa.—City Engineer Harvey Linton writes that contract was let Joseph P. Harney for 767 feet 48-inch brick sewer at $6.15 per lineal foot; and to Thomas Farrell, W. W. Saupp, Isaac Bender and Charles B. Clark for 8,247 feet of 8-inch pipe sewer.

(Continued on page 31.)

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Aurora, Ill.—The contract for sewer extension in District 5 has been let H. D. Hallett, at $4,195.

Bessemer, Colo.—J. M. O'Rourke Con. Co. has been awarded the contract for the sewer at $335,000.

Camden, Me.—The contract for 2,321 feet of sewer has been let Fales & Simmons, of Rockland.

Fairhaven, Vt.—The contract for a sewer system has been let Golden & Hall, Troy, N. Y., at $33,389.

Guttenberg, N. J.—C. T. Vasal has been awarded the contract for a sewer in Franklin street, at $12,000.

Jersey City, N. J.—The contract for a sewer in Fairmount and Fairview avenues has been let C. J. O'Neill.

Methuen, Mass.—E. B. Roberts, of Swampscott, has been awarded the contract for sewers.

Nashville, Tenn.—The contract for a new sewer has been let the Nashville Paving Company for $794. Also contract let Foster & Creighton for the construction of a sewer for $40,000. The lowest bid for the Phillips & Buttorff sewer was received from J. Davis.

Newcastel, Pa.—Dean & Haven, of New York, have received the contract for the Mahoning avenue sewer; W. H. Mitchell the Swansea avenue sewer.

New Orleans, La.—Dawdle & Windett have been awarded the contract for constructing sewer.

Oregon City, Oregon.—The contract for a sewer in District No. 3 has been let W. E. River, Portland, at $15,300.

Pendleton, Oregon.—The contract for a sewer system at this place has been awarded G. H. Sutherland Co., of Walla Walla. The contract for sewer pipe has been let the Denny Clay Company, Seattle, Wash.

Poughkeepsie, N. Y.—The contract for sewers in two streets has been let Peter Morgan.

Pueblo, Colo.—The contract for a sanitary sewer has been awarded the J. M. O'Rourke Const. Co., at $335,900.

Quincy, Mass.—The lowest bids for sections 11 and 12 of 20-inch pipe sewer were received from T. J. O'Connell and James H. Ferguson.

Westboro, Mass.—D. A. Dorey & Co. have been awarded the contract for sewer work.

LIGHTING AND TELEPHONE

Alexandria, La.—Reports state that William Polk applied for a franchise to build a gas plant to furnish gas for fuel and lighting purposes. D. C. Williams, Chicago.

Augusta, Ga.—It is reported that an electric light and power plant will be erected and operated by Leonard Phinizy and associates.

Baltimore, Md.—The superintendent of lighting has recommended the construction of a municipal light plant. Report states that a franchise for constructing a gas plant has been asked by Joseph Schriver.

Buffalo, N. Y.—Reports stated that the council would recommend the installation of a municipal light plant.

Chattanooga, Tenn.—It was reported that the Hamilton Telephone and Power Co. would apply for a franchise for constructing an underground telephone system.

Chattanooga, Tenn.—Local reports stated that the E. Tennessee Telephone Co. would spend $15,000 in erecting new buildings and additional switchboard. Also that in case the railway and light companies combine, the probabilities were that $1,000,000 would be spent for improvements.

Chelan, Wash.—E. B. Curtis was granted a franchise for an electric light plant.

Clayton, Ala.—Local reports stated that $20,000 in bonds would be issued for building an electric light plant and water works. J. S. Williams, Mayor.

Clayton, Ark.—An entire equipment for the water works and electric light plants is needed, according to reports.

Cloverport, Ky.—Press reports state that the Perfect Combustion Company of America, E. B. Brice, President, would install an electric plant for city lighting in the yards of the Patton Vitrified Brick Co.

Colton, Cal.—Reports state that the Trustees have been considering a gas plant, the plans having been prepared by George B. Ellis.

Columbus, Miss.—It was stated that an incandescent light plant would be installed at this place.

Dayton, O.—Reports state that H. J. Dargh, City Hall, Dayton, has prepared plans for the $1,500,000 electric plant at Cumberland Falls, near Cumberland City, Tenn.

Denton, Tex.—An electric plant at this place has been under consideration.

Dickson, Tenn.—A $30,000 bond issue for erecting water works and an electric plant here has been talked of.

Dravosburg, Pa.—Peports state that a street lighting system would be installed.

Excelsior, Minn.—John Lind, of Minneapolis, has been granted a franchise for an electric light plant.

Fairmount, Ind.—The formation of a company for the purpose of erecting an electric light plant has received some attention. City Clerk Briles.

(Continued on page 32.)

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Fenelon Falls, Ont.—It has been reported that an electric light plant would be erected here.

Geneva, Ala.—Reports state that this place would install electric light and water plants at a cost of $20,000.

Harper, Kan.—The erection of an electric plant has been under consideration.

Harrodsburg, Ky.—Bids were asked June 27th for $18,000 worth of bonds for electric light purposes.

Lyon Falls, N. Y.—This place has voted to spend $500 a year for electric lights in streets.

Madison, Minn.—Improvements to the municipal electric plant have been under consideration.

Mount Joy, Pa.—The Solar Gas Light Company has been incorporated at $10,000.

New Decatur, Ala.—Reports state that $50,000 is to be spent on enlarging the electric light plant.

Newport, Wash.—A Spokane company is to supply this place with electric light.

New York, N. Y.—Plans for a municipal light plant have been drafted and Mayor Low was asked to authorize bids for the same.

Noblesville, Ind.—The plans for a power house to cost $80,000, are ready. Thomas Griffin.

No. Birmingham, Ala.—It has been stated that $25,000 in bonds would be issued for water works and $15,000 in bonds for an electric light plant.

Ocilla, Ga.—$15,000 in bonds have been issued for school buildings and an electric light plant. The Mayor.

Ozark, Ala.—It is stated that the installation of an electric light plant has been considered.

Palouse, Wash.—D. G. Klinefelter, Shelton, desires a franchise for an electric plant, according to latest reports.

Russellville, Ala.—It was said that an electric light plant would be installed at this place.

Salem, Ore.—Bids are wanted July 6, for electric lights in the capitol, penitentiary, etc. Board Public Buildings.

Salinas, Cal.—A franchise for an electric light plant was asked by A. B. Fitch.

Union, Ia.—This town will have an electric light plant.

Warren, Ont.—Bonds for light and water plant were recently voted.

Whitley, Ore.—R. E. Speakman, of Toronto, Ont., has made the plans for an electric light and water plant.

Winder, Ga.—$15,000 in bonds were voted for an electric light plant. Mayor. Bids are wanted July 10th for an electric light plant to cost $10,000.

Woodstock, N. B.—$7,000 will be spent, according to reports, for putting new machinery in the electric plant. Chn. McIntosh, Light Committee.

Contracts Awarded

Attleboro, Mass.—The contract for the sub-station of the Interstate Consolidated Street Railway Company has been let E. K. Watson, Warren, Mass.

Caledonia, Minn.—The contract for an electric light plant has been awarded S. G. Reque, Caledonia.

Charleston, W. Va.—The Kanawha Water & Light Co. has let contract for pumping station and electric plant to A. F. Withrow & Co.

Eugene, Ore.—The contract for the power plant at Lucky Boy Mines has been let the Union Iron Works, San Francisco.

Killarney, Man.—The Ernest S. Harris Company has received the contract for machinery for the Kilarney Electric Light Company.

Lake Linden, Mich.—The Houghton Co. Electric Light & Power Co. has been awarded the contract for lighting the streets of the village. It is stated that a gas plant will be built.

Pueblo, Colo.—The contract for an electric light plant for the asylum has been awarded Skinner & Sethman, at $12,850.

Rich Hill, Mo.—Guido Jaeger has received the contract for improvements to the electric light, gas and water works plants.

St. Louis, Mo.—A contract has been let by the Laclede Gas Light Company to Abbott-Gamble Company, 32 Broadway, New York.

West Palmbeach, Fla.—The Florida Electric Company, Jacksonville, has been awarded the contract for a light plant for the West Palmbeach Electric Light & Power Company.

Winona, Minn.—The contract for street lights has been let the Winona Railway & Light Company for ten years at $68 per lamp.

PUBLIC BUILDINGS

Albion, N. Y.—The erection of a new jail is under consideration.

Anderson, S. C.—Avery Carter & Co., of Spartanburg, S. C., have completed plans for a new school.

Augusta, Me.—It has been voted to build the Lincoln street school, at $12,000.

Boise, Idaho.—$28,000 school bonds were to have been sold in June.

Camden, N. J.—Plans for a new court house are under consideration; contract to be let in January. Co. Clerk.

Colfax, Wash.—It was stated that $10,000 worth of school bonds would be sold June 23. L. E. Allen, Treas.

Cordele, La.—The city has voted to issue $10,000 in bonds for erecting a new school house.

Corunna, Mich.—Plans for a $75,000 court house have been accepted from Clare Allen, Jackson.

Danbury, N. C.—Designs for a new court house are under consideration. J. S. Taylor.

(Continued on page 33.)

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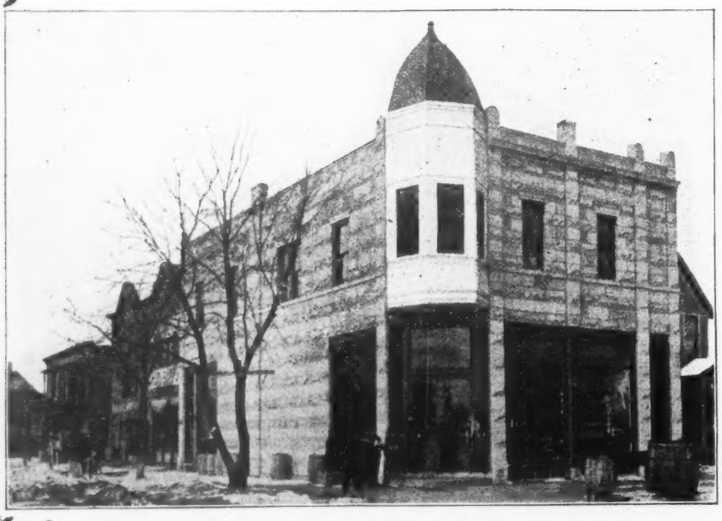

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Dothan, Ala.—Bids are wanted August 1st for a $60,000 court house and a $20,000 jail.

Eagleville, Tenn.—City hall will be erected. The Mayor.

Fairbury, Neb.—$25,000 in bonds have been voted for a school.

Fairview, B. C.—A new high school to cost $90,000 is being considered.

Geneva, O.—A Carnegie library to cost about $5,000 may be erected here.

Humbolt, Tenn.—The city has voted to issue $18,000 in bonds for erecting school buildings. The Mayor.

Huntington, Ind.—A new court house and city hall may be erected. County Commissioners.

Johnson City, Tenn.—Bonds to the amount of $25,000 have been voted for school and street building. A $75,000 government building will be asked.

Kalamazoo, Mich.—A court house will be enlarged at a cost of $50,000.

Kinston, N. C.—Plans for improvements to the court house are being considered.

Little Rock, Ark.—Will build a $1,000,000 State Capitol. State Capitol Coms.

Lumberton, N. C.—The county has voted to issue $10,000 in bonds for a new jail. Co. Comrs.

Montgomery, Ala.—The City Council will hold an election on July 20th for the issuance of $50,000 in bonds for the purpose of enlarging the schools. Secretary, Board of Education.

Morganton, N. C.—Plans for remodeling the Burkes Co. court house are being prepared by Frank P. Milburn.

Steelton, Pa.—A new fire house for the Baldwin Hose Company is contemplated. Committee on Town Property.

Trenton, Mo.—A $60,000 court house will be built.

Valdoosta, Ga.—A new court house for this place will be built at a cost of $60,000. Co. Commissioners.

Waco, Tex.—Bids are wanted July 8th for extension to the court house, etc. J. K. Taylor, Treasury Department, Washington, D. C.

Yonkers, N. Y.—A new site for a city hall to cost $250,000 has been under consideration.

Youngstown, O.—The Board of Education will issue $25,000 in bonds for schools. Finance Committee.

CONTRACTS AWARDED

Aberdeen, S. D.—The contract for a high school has been let J. H. Nickel, St. Paul, Minn., at $27,000.

Albany, Ga.—The W. T. Hadlow Company, Jacksonville, Fla., has been awarded the contract for the court house, to cost $40,000.

Ames, Ia.—Contract for the Iowa State College Building has been let H. W. Schlueter, Chicago, at $260,000.

Baltimore, Md.—The contract for erecting the addition to the court house has been let Brown & Hildebrandt.

Beaumont, Tex.—The contract for rebuilding the public building has been let William Weber, at $52,000.

Brooklyn, N. Y.—Contract has been let D. J. Ryan for repairing the borough hall, etc., at $53,000. A $700,000 gymnasium at the Navy Yard is being planned.

Buffalo, N. Y.—Mosier & Summers have been awarded the contract for a nurses' home at the almshouse, at $60,000.

Cheyenne, Wyo.—A number of contracts have been let for buildings at Fort D. A. Russell. Capt. W. Scott, Q. M.

Clinton, Ia.—Contract for a library to cost $45,000 has been let Cullen Brothers, Janesville, Wis.

Fall River, Mass.—Brattle & Wilcox have been awarded the contract for a registry building at $120,900.

Greensboro, N. C.—W. C. Bain has been let the contract for remodeling the court house.

Gulfport, Miss.—The contract for erecting a new jail has been let M. T. Lewman & Co., Louisville, Ky., for $14,789.

Racine, Wis.—The contract for the Washington school has been let H. R. Edwards, at $26,800.

St. Johns, N. B.—The contract for a public library has been let James Myles, Wentworth street, $44,500.

State College, Pa.—The contract for a library at Penn. State College has been let S. F. Payne & Co., Juniper street, Philadelphia.

Williamsport, Pa.—The contract for the new Franklin school has been let Samuel Larrivee for $34,311, less $500 for the old building. School Board.

Winnipeg, Man.—Smith & Sharpe have been awarded the contract for the Carnegie library, at $71,000.

WATER SUPPLY

Alexander, Ala.—$17,000 in bonds will be issued for water works. Mayor.

Allegheny, Pa.—Bids are wanted August 1st for a pumping station. Director Fulton, Board Public Works.

Atlantic City, N. J.—$75,000 worth of bonds for water purposes were to have been sold June 22nd.

Augusta, Me.—This city may purchase the works of the Augusta Water Company.

Avon, N. J.—Water and sewer systems will be built.

Ballard, Wash.—The extension of the reservoir is under consideration.

Bethlehem, Pa.—The Bethlehem Consolidated Water Co. will install a filtration plant. Supt. Heebberoth.

Brunswick, Me.—A new water supply is under consideration. Water Works Trustees.

Brushton, N. Y.—The installation of water works is not improbable. Luther E. Ellison, Winthrop.

Buffalo, N. Y.—This place can now bond for $500,000 for new water supply. Commissioner of Public Works Ward recommends filtration.

Cameron, Mo.—A vote is to be taken on $80,000 of bonds for works, plans of which have already been prepared.

Cleveland, O.—The West Side water tunnel may be extended to crib No. 3, at a cost of $600,000.

Cohoes, N. Y.—A better water supply is under consideration by the Water Board.

Columbia, S. C.—An increased water supply is being planned.

Columbus, Ga.—On August 1st $250,000 of water bonds will be sold.

Columbus, O.—Better fire protection for the city is desired. Water Works Supt. O'Shaughnessy.

Corrizo Springs, Tex.—The Neuces Valley Irrigation Company has been incorporated, with a capital of $35,000, for constructing an irrigation system. J. S. Taylor.

Crete, Ill.—Water works to cost $14,000 have been planned. Village Clerk.

Dallas, Tex.—Improvements to the water works are being planned.

Dayton, O.—The expenditure of $56,000 on pipe line extension is contemplated. About 16,000 feet of pipe will be laid.

Denton, Tex.—The cost of additional water works and lighting plant to be estimated by the Finance Committee of the Council.

(Continued on page 34.)

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E. Orange, N. J.—A new water supply is being sought. Clerk of Council.

El Paso, Tex.—A new system of sewerage and water works will be constructed at Fort Bliss. S. P. Brosius, C. E.

Emerson, Neb.—Plans for water works are being made. Mayor Kellog.

Fayetteville, N. C.—Bids are wanted July 1st for $100,000 water works bonds. City Clerk.

Florence, Colo.—The meter system will be adopted.

Ft. William, Ont.—Water works will be constructed here.

Grand Forks, N. D.—A vote will be taken on July 2nd on a water supply for E. Grand Forks.

Grand Junction, Colo.—The filtration of water is contemplated here.

Gulfport, Miss.—Water works to cost $40,000 will be installed at this place.

Hamilton, Ont.—$100,000 has been voted for water works improvements.

Harrisburg, Pa.—Improvements in the water works are being considered. City Engineer Cowden.

Houghton, Mich.—A water supply for the city is under consideration.

Jersey City, N. J.—$1,125,000 is desired by the Street and Water Board for the coming year.

Keeseville, N. Y.—It has been voted to extend the water works at this place.

Manasquan, N. J.—It was reported that a vote would be taken June 30th on water works for the village, to cost $35,000.

Manchester, Mass.—$20,000 in bonds were voted for extending the mains.

Newton, Mass.—$28,000 will be spent on a pumping plant.

Norfolk, Va.—New 30-inch mains may be installed. Supt. Water Works Smith.

North Sydney, N. S.—$45,000 has been voted to spend on mains.

Oakland, Cal.—Plans for a municipal water plant are under consideration.

Odessa, Wash.—Water works bonds to the amount of $12,000 will be issued.

Owensboro, Ky.—The cost of water works is receiving the attention of the citizens.

Oxford, Mass.—Water works for this place have been considered recently.

Perryville, Md.—The construction of a new system of Water works is contemplated. The Mayor.

Perryville, Md.—A new water works company may possibly be formed here.

Pickens, Miss.—Bonds for the construction of a water works system have been issued.

Pittsburg, Pa.—The water mains in the business sestion will be extended at a cost of $90,000. Plans for filtration have again been placed before the Councils.

Port Angeles, Wash.—A franchise will be granted to the one offering the best terms for water works.

Port Arthur, Ont.—Bonds to the amount of $85,000 have been voted for water works. Town Clerk McTeague.

Reading, Pa.—Bids are wanted July 7th for 15,000,000 gallon engine and four boilers. Secretary Felix, Water Commissioners.

Redding, Cal.—New works have been proposed. City Engineer Bursen.

Rockford, Ill.—6,000 feet of water mains may be laid.

St. Johns, Ont.—Water works will be installed. Chn. Hughes, Water Com.

St. Stephen, N. B.—Water works for the city have been under consideration.

Salem, Mass.—An increase of the water supply is being considered by the Water Board.

Salem, Va.—The city will make improvements for increasing the water supply. The Mayor.

Salem, Va.—John M. Ambler, Engr., has prepared the plans for gravity water works.

Salt Lake City, Utah.—A 5,000,000 gallon reservoir has been recommended to the council, the cost of which is placed at $45,000. City Engr. Kelsey.

San Bernardino, Cal.—A water system will be built by the city.

Savannah, Ga.—A new water supply is being considered. The Mayor.

Sherbrooke, Que.—A pumping engine and turbine will be bought.

Tennessee City, Tenn.—The matter of a new supply of water is under investigation by a special committee. Anson King.

Toledo, O.—Plans for a 20-inch main, to cost $32,000, have been prepared. Supt. Cook.

Tupelo, Miss.—The city has voted to issue $60,000 in bonds for building water works and sewerage. The Mayor.

Waynesboro, Pa.—The Waynesboro Water Company will enlarge its works. Supt. Landis.

Wheeling, W. Va.—The water board has asked for an appropriation of $75,000 for mains.

Wilson, N. C.—$40,000 has been voted for water and street bonds.

Wilton, N. H.—The Tyngstown Water Co. will install gravity works.

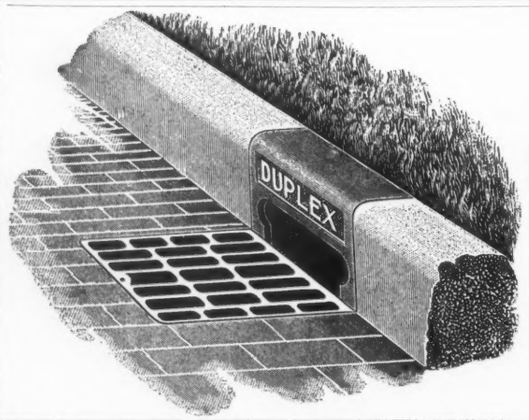
Winchester, Mass.—$20,000 has been voted for a pumping station, etc., on the West Side.

Winston-Salem, S. C.—It was stated that a survey would be made for an additional water supply.. City Engineer Henry.

Yazoo, Miss.—Plans for water works have been prepared. There will be 12 miles of mains, 12 miles of sewers, electric plant, etc. Kirkpatrick & Johnson, Jackson.

Youngstown, O.—City Engineer F. M. Lillie will secure estimates for a filtration plant to cost $150,000.

(Continued on page 35.)



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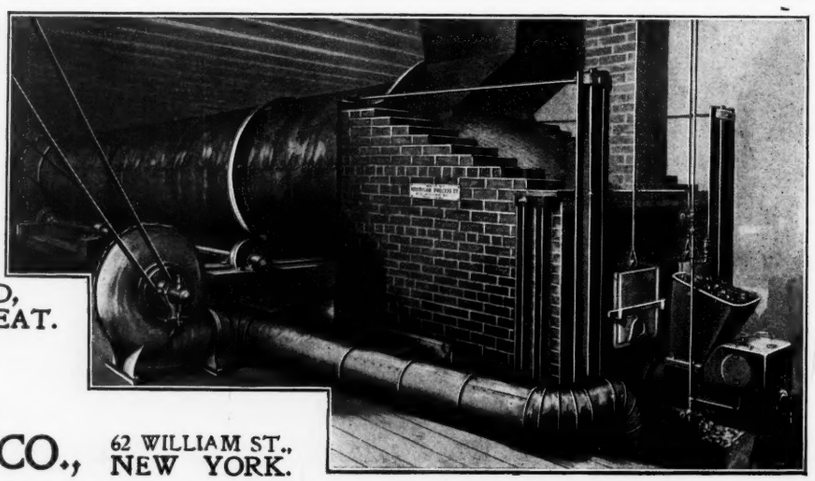

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Yuma, Ariz.—This place will vote bonds for water works.

Zanesville, O.—Plans for a filtration plant will be secured. Board Public Safety.

CONTRACTS AWARDED

Darlington, S. C.—The Darlington Light & Water Company has contracted for improvements to cost about $10,000.

Davis, Ind. Ter.—The contract for water works has been awarded to George G. Bayne.

Dexter, Me.—The lowest bid for laying water pipe was from George E. Foster, Lisbon Falls, Me.

Duncan, Ind. Ter.—Contract for constructing water works system has been let to Duncan Light & Power Co. at a cost of about $25,000. O. J. Gorman, Engr., Dallas, Texas.

Elgin, Tex.—The General Municipal Construction Co., of Dallas, Texas, has been awarded the contract for constructing a water works system at $20,000. M. Griffin O'Neill, Engr., Dallas, Texas.

Ellendale, Minn.—Contract for water works has been let the National Construction Company, of South Bend, Ind., for $6,650.

Fort Worth, Tex.—Contract has been awarded Tucker & Vinton for a filter bed, at $46,000.

Freeport, Minn.—Contract has been let W. D. Lovell, Des Moines, Ia., for water works, at $7,824. Village Recorder Harren.

Harriman, Tenn.—The contract for a reservoir has been let Van D. H. Smith, Knoxville, at $12,000.

Port Washington, N. Y.—The Nassau Water Co., of Glen Cove, has been awarded the contract for a water supply.

Rochester, N. Y.—The contract for water mains has been let to Crahan & Kearns, for $3,406. Mayor Rodenbeck.

Rockwall, Tex.—The General Municipal Construction Company, of Dallas, Texas, has received the contract for constructing a water works system, at $11,000.

Salem, Ore.—Jacobsen, Bade & Co., Portland, have been awarded the contract for 8,000 feet of four and two and one-half mains.

Salt Lake City, Utah.—The contract for a canal system has been let Lyman Skeen, Ogden, at $300,000.

Seattle, Wash.—The contract for a water main on 29th avenue has been let Stirratt & Goetz.

Springfield, Mass.—The contract for 20-inch cast iron pipe has been let the Reading Company.

Sterling, Colo.—The contract for water works has been let J. E. Hurd, Plum street, Pueblo, Colo., at $59,000.

Strathroy, Ont.—Harding & Lathorn, London, Ontario, have been awarded the contract for water works at about $35,000.

Tucson, Ariz.—The Tracey Engineering Company, San Francisco, Cal., has received the contract for Nordberg 4,000,000 gallon pumping engine, at $17,180.

Yonkers, N. Y.—Tucker & Vinton, New York, have been awarded the contract for a filtration plant at a cost of $45,895.

FIRE

Baltimore, Md.—The building of a fire station on Garrison avenue for a chemical engine is contemplated.

Corrinna, Mich.—A department has been organized. Chief Serr.

Des Moines, Ia.—The expenditure of about $1,460 for a new fire truck is being considered. City Council.

Douglaston, N. Y.—A new fire company is to be organized, according to reports.

E. Bridgewater, Mass.—The citizens of this place desire better fire protection.

Fairfield, N. J.—A fire alarm system is to be installed.

Fairview, N. J.—This place expects to install a fire alarm system.

Hammonton, N. J.—This place has organized a new fire company which is to be called the "Live Oaks Hose Company, No. 3."

Harrisburg, Pa.—This place contemplates the purchase of two chemical engines and hose carriages, at $1,600 each, and a ladder truck for $1,200. Fire Chief Lutz.

Holland, Mich.—A new hose company has been organized. A Smeerge.

Jersey City, N. J.—Three new fire stations are to be built in the 12th Ward.

Jesup, Ia.—A fire company will be organized here.

Laurel Springs, Pa.—A new fire company may be organized at this place.

Lewiston, Mont.—A ladder company will be formed at this place.

Max Meadows, Va.—Fire protection for this place is contemplated.

Mara, Minn.—A fire department may be formed.

Morris, Ill.—Five hundred feet of hose will be purchased in July. Chief Kutz.

Mt. Pleasant, R. I.—A new fire station and new company has been proposed.

Portland, Ore.—Bids are wanted July 17th for a new fire boat. Mayor Williams.

Portsmouth, Va.—Better fire protection for this place is desired.

Redlands, Cal.—The improvement of the fire department is probable, for which bonds are likely to be issued.

Sparrows Point, Md.—A new company has been organized in Baltimore as the Standard Fire Alarm Co. Thomas Long has invented a new automatic fire alarm system.

Tamaqua, Pa.—Better fire service is needed at this place.

Volin, S. D.—The formation of a fire department is contemplated.

West Bay City, Mich.—The city needs better fire protection, including a truck. Chief Cook.

(Concluded on page 36.)

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SEWAGE AND GARBAGE DISPOSAL

Albany, N. Y.—$25,000 will be spent on cleaning out the channel and basin. City Engineer Melius.

Barberton, O.—A garbage disposal plant for this place is under consideration.

Boston, Mass.—It is probable that new bids will be asked for dredging Bass river—15,000 cubic yards. Harbor & Land Commissioners.

Charleroi, Pa.—Bonds for a garbage furnace will be issued.

Chattanooga, Tenn.—The purchase of land for a park at Cameron Hill is recommended by the Council committee.

Cleveland, O.—Plans for garbage reduction and cremation works are being made by the President of the Board of Public Service.

Dayton, O.—The Board of Public Service has been considering the question of a garbage crematory.

Galesburg, Ill.—The cost of a sewage disposal plant is to be ascertained. Alderman Maley.

Greensboro, N. C.—This place will build three septic tanks. City Engineer Sandy.

Herkimer, N. Y.—$5,000 have been voted for improving West Canada creek.

Hightstown, N. J.—The question of a sprinkler for the streets is contemplated.

Jacksonville, Fla.—A new park has been suggested to the Board of Public Works by Mayor Fletcher.

Marietta, O.—It is probable that new bids for garbage disposal will be asked.

Memphis, Tenn.—The purchase of hand street sweepers for asphalt pavements is being considered. City Engineer Omberg.

Milford, Conn.—A survey will be made for dredging in the harbor.

Milwaukee, Wis.—It is said that the Board of Public Works will build septic tanks as required by recent legal decision. The estimated cost is placed at $50,000.

New York, N. Y.—Bids are wanted July 10th for dredging in the Bronx river. Col. Stickney, U. S. Engineers, Army Building.

Omaha, Neb.—A sewage disposal plant will be placed at the foot of Saddle Creek Valley sewer. City Engineer Rosewater.

St. Louis, Mo.—The Assembly of the city is considering the placing of garbage disposal under the Board of Public Improvements.

San Antonio, Tex.—Fountains will be placed in the public parks. Park Commissioner L. Mohucke.

San Francisco, Cal.—Petaluma Creek will be dredged. State Commissioner Public Works, Sacramento.

Seattle, Wash.—The cost and best method of garbage disposal will be ascertained by the City Engineer.

Toledo, O.—The Board of Public Service has been considering the matter of garbage collection.

Topeka, Kan.—The question of street sweeping has been under consideration.

Contracts Awarded

Beverly, Mass.—The contract for watering the streets has been let Josiah N. Trask, at $1,725.

Clarksburg, W. Va.—The city has contracted with the Dixon Garbage Crematory Company, of Toledo, O., for the installation of a crematory.

Kansas City, Mo.—The contract for pipe line inspection has been awarded Henry Jarvis Co., of Chicago, for $1,400.

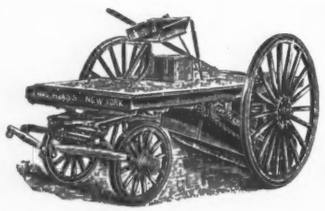
New York, N. Y.—The contract for a garbage plant at Fort Slocum has been let the Municipal Engineering Company, at $3,865.

Pittsburg, Pa.—The contract for 3,000 bbls. cement has been let Murray Bros., Allegheny, at $2.34 per bbl.

Rochester, N. Y.—The contract for sprinkling Oak and six other streets has been awarded George Bautel for $1,055.

Spokane, Wash.—The contract for a garbage crematory, costing $22,500, has been awarded the Decarie Manufacturing Company, of Minneapolis.

Troy, N. Y.—The contract for the disposal of city refuse has been let Zeph. F. Magill for five years, at $9,000 annually. Board Contract and Supplies.



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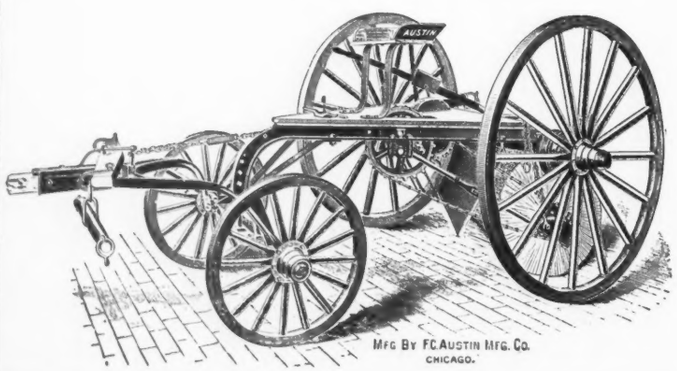

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